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## FAULTY DIET AND ITS RELATION TO THE STRUCTURE OF BONE *


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It is not so many years ago that students of nutrition were told that a perfect diet must include at least sufficient protein to replace that which was consumed by the life processes of the body, and energy-furnishing substances (carbohydrate and fat), as well as sodium, calcium, potassium, magnesium, iron, sulphur, phosphorus and chlorin. The latter substances, except sulphur, could be taken in as inorganic salts.

When, however, it became possible through the advances in physiologicochemical methods to obtain sufficient amounts of purified proteins and amino-acids, feeding experiments were begun to ascertain, if possible, the relative biologic value of various dietary constituents. Analysis of diet by biologic methods (feeding experiments) soon showed that the foregoing food constituents were not in themselves sufficient to maintain life and function in the animal body.

For many years the attention of physicians had been directed toward diet as a factor in the production of scurvy on land and sea, and the work of Takagi in the Japanese navy and of Eijkman had still more recently accented the importance of food in connection with beriberi. Eijkman, who was a Dutch colonial prison physician, noticed that the chickens fed on the polished rice thrown out as refuse from the prison kitchens developed a disease which he called polyneuritis gallinarum, analogous to the human type of beriberi, with which his wards were filled. Further studies of the experimental disease showed that it was curable and preventable if rice polishings (pericarp of the grains) or extracts from them were fed.

From such dietary studies we now know that, besides protein, fat, carbohydrate and salts, the daily food must contain certain substances which have been provisionally termed vitamins.

The nature of these substances is unknown. There are at least three of them: (1) fat-soluble A, (2) water-soluble B and (3) water-soluble C. The first is contained in leafy vegetables, in butter-fat, in the fat of glandular organs, in yolk fat and in actively growing tissues. The second is almost universal in its distribution, but is absent from most fats and is very scantily present in muscle meats. The chief source of the third is from certain citrus fruits, such as oranges, tangerines and lemons, and some vegetables, such as cabbage and scurvy grass. The sweet lime contains almost none of it.

Of these three substances, the second is the least, and the third the most easily destroyed. They are all sensitive to some degree toward heat and oxidation. Thus, while the wide distribution of the vitamins would seem to make their complete absence from any fairly varied diet impossible, the processes which are used in preparing, cooking and preserving foodstuffs today often cause apparently satisfactory regimens to furnish an insufficient supply of these important nutritional factors.

I have intimated that beriberi may result from a deficiency of water-soluble B. In the same way, scurvy follows on the heels of diets deficient in water-soluble C, and an eye disease known as xerophthalmia results from absence of fat-soluble A from the food. Xerophthalmia is not seen in adults in this country, but is occasionally met in certain types of malnutrition in children. On the other hand, it is common in the Orient, and in countries which have suffered severely from war or famine It is characterized by night blindness, photophobia, edema of the eyelids, and dryness of the cornea and conjunctiva. As the disease progresses, infection supervenes and hypopyon develops. The cornea ulcerates and may be lost, and a panophthalmitis may follow, which is finished by destruction of the entire eye. Because of the association of the various vitamins with the production and cure of deficiency diseases, the vitamins have received the names antiophthalmic, antineuritic or antiberiberi, and antiscorbutic substances, respectively.

Custom has sanctioned the use of the term deficiency diseases to describe scurvy, beriberi and xerophthalmia. Many authors would include under this term also rickets, war or famine edema, pellagra and such intestinal conditions as mucous colitis and intestinal ulcerations.

The time has come, however, to sound a warning against attributing every pathologic state which appears during periods of deficient feeding to insufficient intake of vitamins or even to the bad diet alone. We are but just now beginning to be able to analyze diets, and many which were a few years ago considered adequate except for one factor now appear to have a deficit in several factors. It is probably true that vitamin deficiency plays a part in the production of certain states of malnutrition in man, but it is equally true that single deficiencies in the diet of human beings are seldom found. Deficiency diseases in man usually have a complex etiology, and the dietary defects which produce them are often not alone the lack of vitamins. They are almost always complicated by the effects

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of feeding low or incomplete protein and, not infrequently, improper amounts of carbohydrates and salts. Moreover, it is difficult to say in many cases at what point the effects of defective food are complicated by the results of the invasion of the weakened tissue by pathogenic micro-organisms.

It is necessary also to point out the fact that we have indications that the need of the organism for vitamins is in some measure dependent on the amount of, and relation between, other factors in the diet. It is much more difficult, for example, to produce xerophthalmia in an animal when only the fat-soluble A content of the diet is low than if other faults coexist.

We began a study of the bones of animals which had been fed on faulty food in the hope of finding out the factors which operate to produce rickets. We were soon surprised to find, however, that bone, which we usually consider as a tissue with relatively firmly fixed characteristics, is one of the most labile of all the body tissues and the most easily and profoundly influenced by relatively slight changes in the diet. In view of this fact, the production and the study of rickets in our animals was relegated to secondary importance beside the larger biologic aspect of the problem, the study of the growth and physiology of bone.

This study, which has only just begun, reveals that several dietetic principles are concerned in the growth of bone:

(1) An uncharacterized organic substance which is distinct from fat-soluble A. This is to be found in certain oils, notably those of the cod, burbot and shark livers in large amounts. It is present in very small quantities in butter fat and in coconut oil, from the latter of which fat-soluble A is missing. It may belong to the group of vitamins. All we now know of its chemical nature is that it is much more resistant to heat and oxidation than is fat-soluble A.

(2) Calcium and (3) phosphorus, (4) water-soluble B and (5) fat-soluble A. Water-soluble C influences the structure of the bone of the guinea-pig, but the rat either does not need this substance or is able to synthesize it. Although it has been stated that lack of fat-soluble A was responsible for rickets, we were able to show that this was not the case. Bones of animals whose diet is adequate except for fat-soluble A are perfectly calcified, but a high degree of osteoporosis develops. The same result follows the administration of diets having a deficiency only in water-soluble B. When this factor is deficient there is also an aplasia of the marrow, such as follows complete starvation, and, later, hemorrhage into the medullary cavity. If a guinea-pig is deprived of water-soluble C, his bones are identical with those of a rat which has been given an insufficient supply of water-soluble B.

When the organic factor of which I spoke above is absent from the diet or only present in small quantities, all other factors being, so far as we can tell, in optimal concentration, any variation in the ratio between calcium and phosphorus results in a profound disturbance in the structure and functional capacity of the skeleton. A disease of the osseous system, which has the clinical and pathologic characteristics of rickets, may be induced in the rat by diet. It may be induced by diets which are, within certain limits, low either in phosphorus or in calcium, all other dietary factors being maintained at the optimal level for growth and function.

The optimal amount of calcium which the diet can furnish for growth, maintenance and function in the rat has been shown to be 0.641 mg. per hundred grams of ration, when all other factors of the diet are satisfactory. The amount of phosphate has not been so well worked out, but it is about 0.4936 mg. per hundred grams of food. A diet containing 0.832 mg. of calcium and 0.305 mg. of phosphate produces a lesion which corresponds exactly to the most severe form of rickets seen in children.

An animal with such a lesion will have 10 mg. of serum calcium per hundred cubic centimeters. A normal rat will have 10 mg. of serum calcium per hundred cubic centimeters. The blood phosphate for a rachitic animal of this, the low phosphate, type will be 2.5 mg. per hundred cubic centimeters; that of a normal rat will be 8 mg. per hundred cubic centimeters. If an animal is fed on a diet in which the calcium is reduced to 0.052 gm. per hundred grams of ration, the phosphorus remaining at 0.364 gm., a lesion also results which presents all the essential characteristics of rickets. The blood of such an animal will contain from 4 to 5 mg. of calcium and from 8 to 9 mg. of phosphorus.

Howland[1] and Kramer demonstrated identical changes in the salts of the blood of children suffering from rickets as it is commonly seen and, on the other hand, from rickets complicated by latent or manifest tetany.

However, if the organic substance which is so abundantly present in fish oils is supplied freely, rickets will not develop in spite of a faulty ratio of calcium to phosphorus in the food. In other words, cod liver oil will protect an animal against rickets, or cause healing of the lesion, even if the salt content of the diet is such that rickets would invariably develop without the oil. For example, if 2 per cent. of the diet weight of this oil is given to a rat with low phosphorus rickets, in ten days healing will be well advanced and the blood phosphorus will have been raised from the rachitic level to from 4.5 to 5 mg. per hundred cubic centimeters.

Furthermore, animals are enabled to compensate for faulty calcium-phosphorus ratios in the diet if they are exposed to the rays of the sun or the iron-chromium or cadmium arcs or to the light of the mercury vapor quartz lamp. The fact that the beneficial rays from these sources may be screened off by ordinary window glass would seem to indicate that the active rays are in the ultraviolet spectrum. Again, since healing is more rapid under the influence of the cadmium arc than under a chromium-iron or copper arc of equal intensity, the shorter ultraviolet rays (about 2,100 Angström units) probably have the greatest antirachitic effect.

The same changes in the blood salts are induced under the influence of these rays as by cod liver oil. It is interesting to note in this connection that these rays are not protective against, or curative for, xerophthalmia. If a rachitic animal is starved completely except for water, the blood phosphate rises from the rachitic level to 12 mg. of calcium per hundred cubic centimeters, and healing begins at once.

If the phosphate content of the diet is raised above 0.365 gm. per hundred grams of ration, the calcium being at, or below, 0.052 gm., osteosclerosis of varying severity is produced. The tissue, however, remains to a great extent uncalcified.

1. Howland, J., and Kramer, B.: Calcium and Phosphorus in Serum in Relation to Rickets, Am. J. Dis. Child. 22:105 (Aug.) 1921.

# DECALCIFICATION OF TEETH AND BONES, AND REGENERATION OF BONE THROUGH DIET *

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That the teeth and bones are similar in structure has been recognized by nearly all physiologists. Chemically they are very much alike. According to Hoppe-Seyler, the inorganic constituents are the same

Fig. 1.—A condition similar to dental caries in incisors of guinea-pig.

for bone and for dentin, about 85 per cent. calcium phosphate and from 10 to 12 per cent. calcium carbonate. The density of dentin cartilage is about equal to that of bone.

The processes of calcification are analogous. In the teeth the calcification occurs about the processes of the odontoblasts, just as in bone it occurs about the bone cells and forms lacunae. In both, the inorganic constituents are laid down in a colloidal matrix. It would

Fig. 2.—Decalcification of molars with masses of enamel attached.

therefore seem reasonable to infer that a pathologic condition which affected one might affect the other.

This, however, has not been the opinion of dentists. They believe that dental caries is a purely local affair. The present theory is that carbohydrate material adheres to the teeth and, there fermenting, with the formation of lactic acid, forms the cavity of tooth decay. This idea has not been supported by animal experimentation. Twenty guinea-pigs, fed on a diet to which were added large amounts of sugars, viz., dextrose, levulose, lactose, saccharin, dextrin and white flour, showed no dental effect at the end of a year. The sugars and starches adhered to the teeth constantly, and bacterial examination disclosed a fermentative flora; but no dental effects could be detected.

In pathologic conditions of the bone, such as osteomalacia, Levy showed that "the normal relation of 6 $Po_4$ : 10 Ca is retained in all parts of the bone, which would not be the case if the bone-earths were removed by an acid. . . . In osteomalacia the exhaustion of the bone takes place by a decalcification in which one molecule of phosphate-carbonate is removed after another."

Gassman noted that in rachitic bone the calcium (Ca), phosphate ($PO_4$) and carbon dioxid ($CO_2$) relation was not changed. While different investigators have given different findings, many have shown an

Fig. 3.—Irregularity of teeth, decalcification, and absorption of alveolar process, caused by fourteen weeks of scorbutic diet. Note changes in the enamel.

increase of magnesium in pathologic decalcification of bone. In an analysis of sections from fifty teeth, twenty-five of which were from sound teeth and twenty-five from teeth which showed decay, there was about twice as much magnesium in the carious teeth as in the sound teeth.

## METHOD

A cross section of about 1 mm. thickness of the root is selected as near as possible to the enamel border. The cementum and the pulp are removed. The whole section is washed thoroughly in water and dried at 100 C. for twenty hours, cooled in a desiccator and weighed, and burned in a platinum crucible for eight hours. The ash is dissolved in about 15 c.c. half-normal hydrochloric acid. Twenty-five cubic centimeters of this solution is taken for the determination, which is carried out by Kramer's titration method.[1]

Duplicate analyses were also carried out by Briggs' colorimetric method.

The magnesium content is estimated in milligrams. The average percentage of magnesium in fourteen teeth from scorbutic guinea-pigs was 2.881. The average

* Read before the Section on Stomatology at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

1. Kramer, B., and Tisdall, F. F.: J. Biol. Chem. 48:1 (Sept.) 1921.

percentage of magnesium from control guinea-pigs was 1.085.

Although one cannot say that dental caries is not due in part to an external process, still, according to experiments on guinea-pigs, extensive decalcification of teeth and of some parts of the bones is brought about by a disturbance of metabolism induced by scorbutic feeding.

Fig. 4.—Control: regular teeth and normal bone.

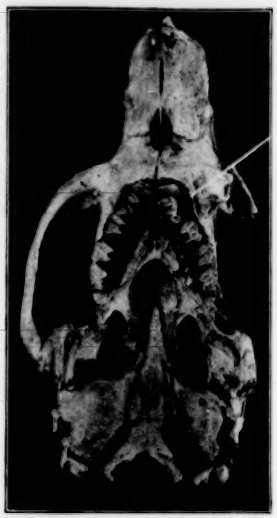

Fig. 5.—A condition similar to pyorrhea: elongation and looseness of the teeth.

The diet that was fed consisted of soy beans, 50 per cent.; rolled oats, to 100 per cent.; dried whole milk, 10 per cent.; butter, 5 per cent.; yeast, 4 per cent.; calcium carbonate, 1.5 per cent.; sodium chlorid, 1 per cent.; agar, 2.5 per cent. The soy beans were ground and placed in the autoclave for thirty-five minutes at a pressure of 15 pounds. The various ingredients were mixed, moistened with distilled water, and rolled into thin sheets, which were dried in the sterilizer. This mixture was broken up and fed. Distilled water was given the animals to drink. Filter paper was fed for additional roughage. Orange juice supplied the antiscorbutic factor, and was administered according to the experiment.

PERCENTAGE OF MAGNESIUM IN TWENTY-FIVE ANALYSES OF SOUND TEETH AND OF DECAYED TEETH

| Sound Teeth | Decayed Teeth | Sound Teeth | Decayed Teeth |
|---|---|---|---|
| 0.638 | 1.585 | 0.745 | 0.977 |
| 0.758 | 0.854 | 0.730 | 1.116 |
| 0.671 | 1.882 | 0.759 | 0.918 |
| 0.649 | 1.085 | 0.742 | 0.835 |
| 0.554 | 0.825 | 0.614 | 1.804 |
| 0.566 | 0.937 | 0.619 | 1.259 |
| 0.621 | 1.309 | 0.588 | 1.098 |
| 0.527 | 1.256 | 0.687 | 0.861 |
| 0.627 | 1.027 | 0.563 | 1.337 |
| 0.629 | 1.040 | 0.586 | 1.254 |
| 0.764 | 1.221 | 0.710 | 1.270 |
| 0.651 | 0.970 | 0.567 | 1.013 |
| 0.662 | 1.142 | Average 0.649 | Average 1.154 |

In fourteen weeks the teeth were extensively decalcified. The alveolar process was gone. The teeth were elongated and loose. The peridental tissues showed a series of changes which ranged from a hemorrhagic condition to complete disintegration with pus formation. In young animals, on the fifteenth day, the joints were affected so that difficulty in the use of the legs was manifested. The joints were swollen and painful. Under chloroform anesthesia, marked, localized hemorrhagic areas were revealed at the knee-joints of the hind legs and wrist-joints of the front legs. The joints were much enlarged. The animals had eaten well and gained in weight. This condition disappears in a few days if orange juice is administered. In older animals this trouble occurs later. If the animals are kept in a latent scorbutic condition for some time, from seven to nine months, the femur and the tibia decalcify extensively, and during dissection pull apart at the epiphyseal line.

When these animals are fed an ample amount of antiscorbutic food, calcification occurs; large areas of newly forming bone are seen on the jaws and the leg bones show exostosis. Lipping or areas of new bone formation are found along the shaft of the bones. The cartilage may calcify, with ankylosis following.

It is to be doubted whether in all cases the recalcification is due wholly to the diet. It may be that in some cases tissue degeneration proceeds to the point of calcification. The process may be similar to that which takes place when implanted cartilage calcifies, or to that which follows ligation of the renal vessels. However, in the present cases the initial process begins as a vascular and circulatory disturbance induced by the diet, and is rectified by improving the diet.

Fig. 6.—Enamel marked by alternating normal and deficient diets.

Many other pathologic or abnormal conditions occur as a result of protracted antiscorbutic deficiency which, although outside the immediate province of this paper, still are significant in the mode of action on tissue. One of these is the effect on the eye. A slight scorbutic effect on pregnant mothers has resulted, in a

number of cases, in the absence of eyes in the young. I have had several animals born with only one eye or one good eye, and the other sightless or imperfectly formed. Many are born with spots on the outer coating of the eye, which clear up under proper feeding. In animals on the scorbutic diet, eye trouble follows

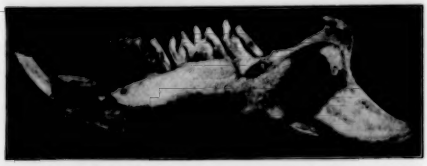

Fig. 7.—Thirty-three weeks: normal feeding about half of the time, with new bone formation.

even to the point of pus welling out over the eye during eating. Feeding orange juice is followed by complete clearing up of the trouble.

We have been working on monkeys for only about seven months, but arthritic disturbances are very pronounced; in two out of the four animals a condition resembling arthritis deformans occurs. The knee-joints enlarge to twice the normal size. The spinal column is curved, and the animal remains curled up, holding the head down. The mouth becomes filthy,

Fig. 8.—Fifty-sixth week: new bone formation complete; same series as in Figure 7.

with excessive tartar formation, and the teeth become loose.

Exophthalmos occurred in the four experimental animals; large hemorrhagic areas have appeared in the supra-orbital region and under the eye. The eyes were covered with a film in one severe case. Blood trickled from the eye and mouth during an attempt to eat. The animal became temporarily blind. In all cases when orange juice was fed, the entire condition cleared up. If, however, the lens has become affected, it fails to clear, with the production of cataract. Cataract was so produced in one monkey and also in guinea-pigs.

The conditions described appear to be distinct from rickets. Unquestionably a proper supply of calcium and phosphorus is important, but, of the two, calcium seems to be the inorganic constituent that in modern diets is most likely to be deficient. Statistics and research indicate that the requirement, particularly for children, is greater than was formerly believed. It is well understood that calcium serves to regulate the equilibrium in almost any irregularity of the body mineral elements. But with all the proper food factors supplied except the antiscorbutic, the animal organism appears still to withdraw calcium from the teeth and some parts of the bone.

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## THE EFFECT OF DEFECTIVE DIETS ON TEETH

### THE RELATION OF CALCIUM PHOSPHORUS AND ORGANIC FACTORS TO CARIES-LIKE AND ATTACHING-TISSUE DEFECTS *

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From its inception, dental literature has contained many statements associating food habit with oral disease. Dietary errors or excesses are said to be predisposing, if not active, causes of dental caries and gingival lesions. It is also implied that these diseases do not exist in races or individuals with correct food habits, the inference being that a proper dietary regimen will prevent oral pathologic conditions. Tangible evidence of what constitutes a correct diet is not offered by the donors of these hypotheses, which, when applied in daily routine, are not practical in the individual, whatever they may be *en masse*.

We are told that races living under primitive dietary conditions are free from oral disease: the Eskimo is said to be immune for the reason that he is essentially carnivorous, using little carbohydrate food; and the Maori, because he consumes quantities of carbohydrate and little protein food. In the midst of this exigency stands the fact that Anglo-Saxon races of all climes, with the greatest abundance and diversity of food, are being involved by oral disease to an alarming extent.

Function, or the lack of it, is said to be the predetermining factor in the induction of these diseases. The refinement of foods, which are softened by cooking, is cited to explain the prevalence of dental disease with every advance in civilization, in spite of the fact that persons of civilized countries obtain a larger percentage of better food per capita than those of primitive races. It is asserted, for example, that just as the consumption of refined cane sugar and bolted flour increases, so dental caries increases, and

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today it involves 25 per cent. of the teeth of 85 per cent. of American schoolchildren.

For the most part, these statements are generalizations with as much foundation in fact as casual observation permits, though they all may contain elements of truth. There are so many qualifying and disturbing factors entering into any investigation of diet in relation to disease that the student is soon lost in a maze as to the relation of the simplest basal dietary elements to digestive and metabolic processes, not to mention the modifying influence the endocrine glands and pathogenesis may have on the resultant equation.

It is well, therefore, to hesitate before drawing conclusions as to the simplest diet fed an experimental animal, for it does not necessarily follow that these elements arrive in the cells of osseous and dental tissues without profound modification, which digestive and metabolic processes are bound to induce. This is well illustrated by the present tendency to associate deficiency diseases with absence of vitamins, neglecting more important basal dietary factors.

It is recognized that too great a simplification of the diet may, in itself, lead to deficiency disease; yet under these conditions the subject can be intelligently approached only by a study of diets which make for well-being in the animal and are as elemental as possible. That such dietetic study is feasible has been proved by E. V. McCollum and his associates in some 8,000 animal dietary experiments. For the sake of clarity in this report, but three basal dietary factors are considered: calcium, phosphorus and the organic substances existing in butter fat and cod liver oil; and these are considered in their relative concentration and percentage.

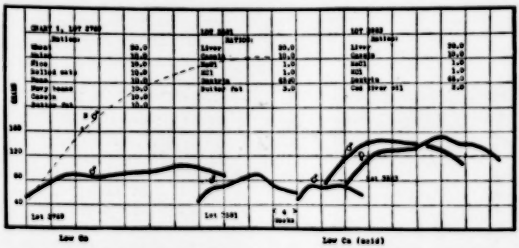


Fig. 1 (Group 1, low calcium diets).—"Lots 2769, 2581 and 2883 are grouped because the only deficiency is a lack of calcium. In 2769, casein improved the vegetable proteins, and in 2581 and 2883, the addition of liver enhanced these factors. Butter fat and cod liver oil furnished fat-soluble A. All factors are satisfactory except calcium: when it is added to these diets, good growth and high fertility occur; without it, there is little growth and no young are produced." [6]

## ORAL CONDITIONS IN RATS

It was my good fortune to study oral conditions in the same group of rats which were used in the recent research on rickets and related osseous pathology by McCollum, Simmonds, Shipley and Park, of the chemical hygiene and pediatric departments, Johns Hopkins University. Reports of these researches, which are too voluminous for quotation, are available to those interested.

Osseous and dental tissues are so closely related that the conclusions in these papers are here summarized:

These reports have shown that the internal structure of the skeleton of the rat could be changed at will by varying the ration which the animals received. In other words, bone is an extremely labile tissue and is readily influenced by nutritional environment.[1]

A study of the effects of these diets on the skeleton would indicate that the growth of the skeleton was dependent on at least three substances: (1) an organic substance present in certain fats which may, or may not, be identical with the antixerophthalmic fat-soluble A; (2) calcium, and (3) phosphorus.[2]

If the organic factor is low in, or missing from, a diet, the structure of the osseous tissue is dependent on the ratio between the above mentioned ions in the diet and circulating blood.

If calcium is present in amounts equal to, or exceeding, those which would be optimal for growth and function and if all other factors are satisfactory but the phosphate ion is low, rickets is produced.[3]

The same disease results when the converse relation exists between the two ions.[4]

Diets which contain optimal or excessive amounts of calcium but are low in phosphorus and the organic factor produce rickets.

Rickets also results from feeding diets low in calcium and the organic factor if phosphorus is present in satisfactory amounts.

Diets which are satisfactory except that they are deficient in the organic substance result in osteoporotic but perfectly calcified bone.

Diets which have a comparative deficiency in calcium but are very high in phosphorus and in the organic substance produce so-called osteosclerosis, with large numbers of small, imperfectly calcified trabeculae.

Diets deficient in calcium alone produce a pseudorachitic condition with overproduction of osteoid.[5]

The studies of diets which contain varying percentages of calcium and calcium phosphate show that the absolute amount of either ion in the diet is of relatively little importance as compared to the ratio which exists between the two. That is, normally calcified bone is produced without regard to the reduction or diminution of either calcium or phosphate in the food, provided the content of the other ions is proportionately augmented or depressed.

## RESULTS OF DEFECTIVE DIETS

Good growth, well-being, fertility and normal osseous tissues were induced in the rat when the relation of the total calcium was 0.64 and phosphorus 0.41 to 100 gm. by weight, with butter fat at 2.5 per cent. and cod liver oil at 1.5 per cent. of total diet, representing the organic factors, provided other dietary elements

1. McCollum, E. V.; Simmonds, Nina; Shipley, P. G., and Park, E. A.: Studies on Experimental Rickets. I. The Production of Rachitis and Similar Diseases in the Rat by Deficient Diets, J. Biol. Chem. **45**: 333 (Jan.) 1921.

2. Shipley, P. G.; Park, E. A.; McCollum, E. V., and Simmonds, Nina: Studies on Experimental Rickets, III, A Pathological Condition Bearing Fundamental Resemblances to Rickets of the Human Being Resulting from Diets Low in Phosphorus and Fat-Soluble A: The Phosphate Ion in Its Prevention, Bull. Johns Hopkins Hosp. **32**: 160 (May) 1921.

3. McCollum, E. V.; Simmonds, Nina; Shipley, P. G., and Park, E. A.: Experimental Rickets, VI, The Production of Rickets by Diets Low in Phosphorus and Fat-Soluble A, J. Biol. Chem. **47**: 507 (Aug.) 1921.

4. Shipley, P. G.; Park, E. A.; McCollum, E. V., and Simmonds, Nina: Studies on Experimental Rickets, XIX, Is There More Than One Kind of Rickets? Am. J. Dis. Child. **22**: 91 (Feb.) 1922.

5. Shipley, P. G.; Park, E. A.; McCollum, E. V., and Simmonds, Nina: Studies on Experimental Rickets, VII, The Relative Effectiveness of Cod Liver Oil as Contrasted with Butter Fat for Protecting the Body Against Insufficient Calcium in the Presence of a Normal Phosphorus Supply, Am. J. Hyg. **1**: 512 (July) 1921.

were correct. In this paper,[6] five diets are presented, which were selected from the fifty-seven diets previously reported when oral conditions were studied in relation to osseous disease.

That the dietary equation may be further simplified, the percentage of phosphorus in all of these diets is optimal (0.41 to the 100 gm.), while calcium and the organic factors in butter fat and cod liver oil are intentionally varied above or below normal percentages. This was accomplished "without making the deficiencies or concentration any greater than those which occur in the table of the modern American family."[6]

It is emphasized that no sucrose exists in these diets; in one, 10 per cent. of whole milk powder occurs, which contains its small percentage of lactose. If oral fermentation has any part in inducing osseous lesions, the starches in which these diets abound may be active factors. These diets all contained ample water-soluble B; as the rat synthesizes water-soluble C, the gingival lesions to be reported are not scorbutic, such as occur in the guinea-pig.

All diets were so finely ground as to prevent selection of food, and all experimental animals were adults and were placed on the diets at the age of about 60 days. They were taken, without selection, from the stock colony which lives on a stock diet under the best possible hygienic laboratory conditions and is free from other disease. It may be stated, as a control, that the stock rats in this colony show no caries-like or attaching-tissue defects.

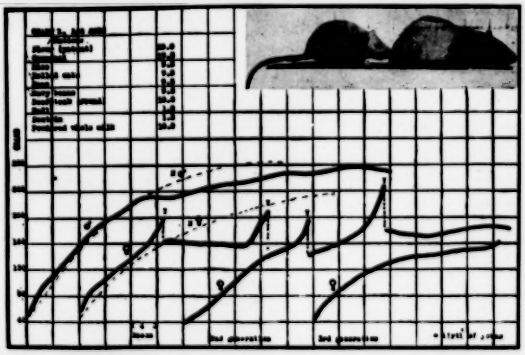


Fig. 2 (Low calcium and low fat-soluble A diets).—"This diet contains milled cereals, milk and meat; it is lacking in calcium and fat-soluble A. Rats confined to this diet do not grow fully, age early, and are not fertile. Families confined to this diet show gradual deterioration. It is only necessary to add calcium and fat-soluble A to change entirely the life history of the individual. This diet has been much studied in our laboratories. It contains all of the deficiencies and errors of the average American menu."[6]

Eighty-five rats, about equally divided as to sex, were placed on the following diets:

Group 1, low calcium diets; Group 2, low calcium and low fat-soluble A diets; Group 3, high calcium and high butter fat diets (Figs. 1, 2 and 3).

It is most important, in considering the effect of diet on teeth, that the animal be an omnivorous feeder and that the teeth and attachments be comparable, numerically and histologically, to those of man. Guinea-pigs and rabbits, which ingest herbivorous diets of succulent roots and leaves, and in which the entire denture grows persistently, are not comparable in digestive function or omnivorous dietary to man.

Dogs, pigs and monkeys present ideal oral conditions for experimental study, but they litter infrequently and are prone to infectious diseases. They develop osseous defects, if confined under laboratory conditions and, if allowed freedom, obtain small but definite food factors which might modify the experiment.

The disadvantages of the rat denture, which is small and presents histologic difficulties, are more than offset by assurance of correct experimental conditions. Rats are omnivorous and are prolific breeders, so that many generations can be studied. They do not suffer from confinement or monotonous laboratory diet.

In the denture of the rat, the four incisors grow from persistent pulps, while the twelve molars are coronally and apically completed teeth, all of which are erupted by the fortieth day. The cusps are of the bunodont type, associated with omnivorous diet rather than the lophodont type, associated with the herbivorous diet, as in the guinea-pig.

While the rat's incisors are subject to resorption and repair by persistent pulp function, like incisors and molars of guinea-pigs, the rat's molars are coronally and apically finished teeth and, except for size, numerically and histologically comparable to the human molars. Excellent enamel surfaces in perfect proximate contact; simple dentin of the ortho variety and large pulps with evident high resistance are all excellent indicators of any lesion.

Subgingival attachments are dense and wonderfully adapted to function; the roots present definite cemental laminae with closed and pointed apexes and multiple foramina. Well-defined periodontal membranes are attached by stout alveoli, furnishing excellent support to gingival crests which lie in perfect contact and thus protect embrasures.

In the rat, the relation of masticatory function to diet is ideal; like all rodents, the rats must literally "chew for dear life"; whether the diet be soft or hard, the denture is used until disintegrated, and all teeth are abraded by their own interaction. Any disturbance of this highly vital nutritional function in adult rodents must, indeed, be fundamental. Under such conditions, it is therefore interesting to find caries-like and attaching-tissue lesions involving teeth of adult rats when placed on the foregoing diets, with no such defects in the stock controls.

Percentages of lesions are calculated on the number of teeth involved (twelve molars); the number of rats placed on these diets, and the period on the diet, which averaged 120 days.

Thirty-six per cent. of the males and 44 per cent. of the females showed caries-like and attaching-tissue defects, with increasing percentages in the littering rat, the oral condition of which is most interesting.

In Group 1, the low calcium diets (Fig. 1), phosphorus and fat-soluble A were nearly optimal, while

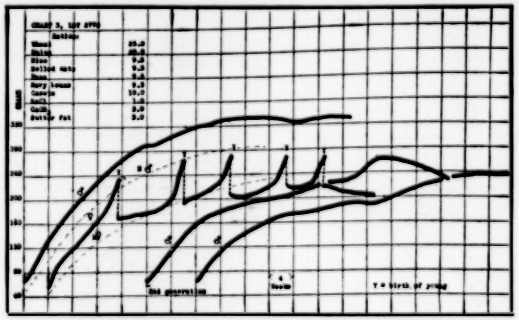
6. McCollum, E. V.; Simmonds, Nina; Kinney, E. M., and Grieves, C. J.: The Relation of Nutrition to Tooth Development and Tooth Preservation, Bull. Johns Hopkins Hosp. **33**: 376 (June) 1922.

calcium was about one-half the normal: the diets are thus simplified to one defect, with all other factors well balanced. When the ash of a diet is acid, as in some of these, it appears to increase the tendency to lesions. Twenty-two per cent. of the rats on these diets showed caries-like defects, and 3.65 per cent. of their molars were involved. Forty-one per cent. displayed attaching-tissue lesions which involved the molars to the extent of 57.9 per cent.

It has been noted that "diets deficient in calcium alone produce a pseudorachitic condition with overproduction of osteoid." Skeletal defects were pronounced in this group, and a large percentage of alveolar involvement was anticipated. It cannot be assumed, however, that diets which affect long bones will always affect tooth attachments, for such is not the case.

It is also evident from the contrasting percentages of caries-like lesions, 3.65 per cent., and attaching-tissue defects, 57.9 per cent., that, as far as dietary factors are concerned in the induction of these lesions, they are not similar in either incidence or type.

In Group 2 (Fig. 2), the low calcium and low fat-soluble A diets, phosphorus was optimal, while calcium was one third of the normal, and fat-soluble A was relatively low; this produced two deficiencies, with all other dietary factors well balanced. Thirty-one per cent. of the rats on these diets showed caries-like defects, and 5.21 per cent. of their molars were involved. Twenty per cent. displayed attaching-tissue defects which involved the molars to the extent of 17.7 per cent.



High Ca + But. F 3%

Fig. 3 (High calcium and high butter fat diets).—"This diet is well constituted except that the calcium is double the optimum. Rats grow well while on it and are fertile, but the young die early. The second generation was stunted, for excessive calcium causes early deterioration." [2]

The contrast in this group is remarkable. A two-fold deficiency, which in the previous study of fifty-seven diets produced the greatest percentage of caries, 5.21 per cent., in this type of diet produced only 17.7 per cent. of attaching-tissue lesions, which was next to the lowest percentage in the previous series of 220 rats.

It has been noted that "rickets results from diets low in calcium and the organic factor, if phosphorus be present in satisfactory amounts." The fact that these diets, which produced experimental rickets and a large percentage of caries-like lesions in rats, induce such comparatively slight attaching-tissue disturbance cannot for the moment be explained. It appears to confirm the clinical observation that, when human caries involves the adult denture, the incidence of gingival disease is low.

It must not be concluded that diets which produce experimental rickets also induce caries-like lesions. A large group of animals in the previous report were definitely rachitic, yet, macroscopically, suffered few oral defects of any type. This low calcium and low fat-soluble A diet is here reported for the very reason that rachitic and caries-like lesions are rarely coexistent.

As there is a prejudice against comparing deductions from animal experimentation with human experience, it might be well to explain these percentages.

With the rat's life cycle at 1 to 30 for the human, a rat from 120 to 150 days old is comparable to a child between the tenth and thirteenth years, especially when differences in developmental cycles are considered. At these ages, the child's teeth are said to be 25 per cent. carious; but twelve, or 50 per cent., less teeth are exposed to carious processes in rats, when compared with an average of twenty-four teeth in children, and 12.5 per cent. represents a like reduction of the 25 per cent. of child caries. When the 12.5 per cent. for the child is compared with 5.21 per cent. for the rat, and when the period of exposure, which was much shorter in the rat, is considered, the discrepancy is not so great as might appear.[3]

The incidence of human gingival disease in adults cannot be stated; it is evidently high, but that it so rapidly involves persons, or their teeth, in any such percentages as here presented for the rat is questionable.

In Group 3 (Fig. 3), the high calcium and high butter-fat diets, phosphorus and fat-soluble A were optimal, but calcium was twice the optimum. This produced but one deficiency, with all other dietary factors in balance. Seventeen per cent. of the rats on this diet showed caries-like defects, and 1.73 per cent. of their molars were involved. Twenty-eight per cent. displayed attaching-tissue defects which disturbed 33 per cent. of the molar attachments.

It has been explained that high calcium diets produce good growth but early deterioration, with pseudorachitic changes in bone, particularly in the second and third generations.

The lesions resulting from this diet, 1.73 per cent. caries and 33.3 per cent. attaching-tissue lesions, are in direct contrast to the low calcium and low fat-soluble A diet, in which the caries-like defects were the highest, 5.21 per cent., and the attachment disturbance nearly the lowest, 17.7 per cent., in the entire series.

### CARIES-LIKE LESIONS

The essentials of dental caries, according to the modern conception, are environmental. It is believed that caries progressively invades teeth from without inward and that it may result from chemicomicroorganic causes in any retention center. Whatever the bacterial types, they are presupposed to produce sufficient acidity to decalcify enamel and dentin, and to be sufficiently proteolytic to complete dentinal destruction.

In this conception it is not denied that teeth may not be predisposed to caries from developmental structural defects, which may result in early formative periods and may assist in localizing carious lesions. The finest types of enamel and dentin may be invaded in the same mouth, and even the same tooth, while hypoplastic enamel and dentin may escape.

Other than this distinction, it does not admit that completed teeth are weakened from within by resorption of dentin, or interglobular space formation arising from dental pulp function; or that enamel may be softened from within, or that it is permeable or vital.

These facts are reviewed for the reason that there have appeared certain sections of rat's molars which suggest some internal factor in human dental caries, but they do not occur in these groups of diets.

The lesions in these groups always proceed from without inward and do not result from hypoplastic enamel, nor are they absorptions from dental pulp function. Clinically, they are identical with human caries.

The minute and slowly enlarging initial lesion in any deep enamel sulcus; the rapid dentinal invasion, undermining enamel walls; the typical laminated carious dentinal detritus, and the final pulp exposure, followed by subapical bone involvement and alveolar abscess, are classic, macroscopically.[4]

The distal sulcus of the first molars and the central sulcus of the second molars are usually seats of initial lesions, which may be due to food retention. Mesial and distal contact facets are occasionally secondarily involved, but they are not primarily attacked as in man. This immunity may arise from the excellent proximate contact and the protection of embrasures by attaching and gingival tissues.

Fig. 4.—Coronal section of macerated molar, decalcified Mueller's fluid, reduced from a photomicrograph, × 90, showing caval walls of caries-like lesion arising in molar sulcus ending in pulp exposure: *a*, sound dentin; *b*, occlusal surface, enamel decalcified; *c*, dental pulp; *d*, fractures in sectioning; *e*, carious detritus; *f*, caval walls with carious tubules and liquefaction foci of Miller; *g*, field enlarged in Figure 5.

These lesions were studied in ground and decalcified sections. Coriell's lapping machine was used in grinding, and Mueller's fluid was used in decalcification. By the latter method, occasional slides were obtained without complete loss of enamel. Slides were stained with thionin, silver and carmin.

Microscopic sections show slow decalcification of enamel, either by loss of inter-rod substance or complete disintegration of both rods and cement substance. Dentinal invasion spreads typically, undermining enamel along the dento-enamel junction. Tubules are enlarged and invaded irregularly; characteristic areas appear, showing complete loss of matrix and projection of fibrils into masses of proteolyzed dentin containing bacteria. Dentinal destruction seems much slower and more regular than in human caries. Frequently observed tubular calcification and osteodentin formation indicates a pulpal resistance much higher in the rat than in man. Pulp involvement and exposure is not unusual. In old cases, the entire tooth becomes dark and necrotic and apical abscess results, with typical apical denudation and destruction of subapical tissues. In some instances, granulomatous or cystic types of apical disease occur, presenting symmetrical bone areas well walled off by condensing osteitis and lined by fibrous tissue, as the stains indicate. In others, much bone liquefaction results, with fistulas. These are evidently of the purulent type, and occasionally result in large osteomyelitic areas.

### THE ATTACHING-TISSUE LESIONS

In reporting these defects, "only such gross osseous lesions as actually exposed cervical aspects of roots or finally caused loss of teeth are presented." The flare of the rat's molar roots is so great and they are so well attached that it may be assumed that such teeth are not lost without the persistence for some time of soft tissue lesions. "Attaching-tissue defects occur in two groups: (*a*) the atrophic types, with progressive horizontal and regular loss of alveolar crests, the cortex remaining hard, rounded and smooth, and (*b*) the infective type, with irregular vertical invasion of alveolar walls and localized root exposure, in which the cortex is rough, porous or missing," as in true pyorrhea. "In short, all phases of the osseous lesions of gingival disease occur as in the human." [4] In both maxilla and mandible, the lingual crests are frequently lost. The disease may localize about one molar or may be general. If complicated by caries and loss of proximate contact, food pack and trauma soon destroy the tooth.

Microscopic slides show much involvement of alveolar walls, which are osteoporotic or cartilaginous, but which still remain intact, supporting the gingival crests.

Occasional peninsulas of bone persist, but trabeculae are indefinite and canalization frequently results. There is much osteoid and round cell infiltration. Deep pockets occur, lined by epithelium, supported by the remaining periodontal fibers, but it cannot be said that they arise by central invasion of the periodontium along lymphatic vessels, as in true gingival disease. Cervical deposits of calculi were noted in some instances: its character together with that of the soft tissue lesions will be reported later.

While only certain rats suffered from caries-like and attaching-tissue lesions, as the percentages indicate, the impression must not obtain that the two lesions did not appear simultaneously in the same rat, for fully one third of the group were so involved.

These experiments had none of the mathematical accuracy of the feeding to guinea-pigs of scorbutic diets, which are said to produce 100 per cent. scurvy.

The varying percentages of damage to tissue present a remarkable resemblance to human disease; they indicate the resistance of the individual rat to these diseases. Its immunity, its superior digestive and metabolic processes, or possibly other factors, evidently protected its teeth and attachments against invasion.

The constancy of the character of caries-like lesions is interesting. From what has been observed, no matter what the dietary defects, they are remarkably alike in microscopic section. Quite the reverse is true of the diseased attachments, the pathologic character of which differs materially, but it is not possible as yet to state the type of lesions induced by any particular diet. Indeed, the entire phenomena run so true to clinical experience as to tempt one to conclusions which might be premature, for, as in man, these lesions appear to result from all types of dietary defects, and it would appear that the animal economy can form and maintain a fine denture, with attachments, on very restricted diets, provided the animal be in proper dietary balance.

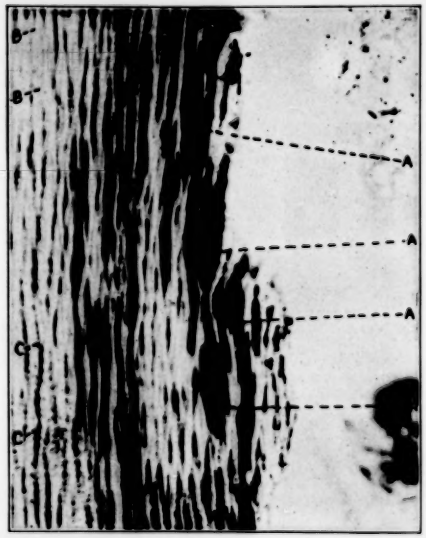



Fig. 5.—Field from Figure 4, reduced from photomicrograph, × 800: *a*, carious tubules, liquefaction foci; *b*, dentin slightly involved; *c*, deeper invasion.

In the absence of sucrose, and with starch as the only oral fermentative medium, it is possible to indulge in many fascinating and plausible hypotheses as to the cause of dental caries, all of which are likely to be wrong. It might be reasoned, since the largest caries-like percentages occurred in Group 2, which contained 10 per cent. whole milk powder, that even this percentage of lactose might have increased the fermentation in the starches in the diet and induced dental caries, were it not for the fact that the stock diet contains a larger percentage of milk and the teeth of stock rats are not carious. From certain evidence, it might be said that disturbances of the calcium-phosphorus balance of the blood, of tetany and rickets, were the main factors in caries; but nearly all children have carious teeth and few children are rachitic or involved by tetany. The reverse is equally true, while very few children, as compared with adults, suffer from gingival disease.

The intricate relation of calcium and phosphorus in the blood to the endocrine secretions, and to tetany and rickets, has been explained by Howland, Tisdall and Kramer.[7]

"Tetany is an expression on the part of the nervous tissues of an insufficiency of the calcium ion; rickets is an expression on the part of the skeleton of disturbed relations between the calcium and phosphate ions. . . . The reason that tetany is so frequently associated with rickets is that rickets is a disease in which the calcium ion in the body tissues and fluids is subject to wide variations."[4] Both of these diseases depend on the calcium-phosphorus balance in the blood, but may occur independently of each other.

Typical rachitic lesions and symptoms are known to result from two types of disturbance as indicated by the blood, i. e., "one in which calcium was normal and phosphorus low (low phosphorus rickets) and the other in which phosphorus was normal and calcium low (low calcium rickets) and there may be others."[4]

Alveolar lesions, which are exposed to oral infection and occlusal trauma, are hardly likely to be more concrete than the internal lesions of rickets. On the contrary, they might be expected to present many more complicated pathologic expressions of simple dietary defects.

This hypothesis cannot as yet be applied to dental caries. It is reasonable to suppose that disturbance of the osseous attachments of teeth might occur from within outward, by the vascular pathway, and that gingival disease might result from the same internal etiologic causes as rickets; but dental caries is an invasion of the tooth, arising externally, and proceeding from without inward. Therefore, one must think of the oral environment as permitting such invasion.

In these specimens, caries-like lesions are so far from being an internal disturbance, or resorption of enamel and dentin by pulp function, that the pulp actually protects its vascularity by tubular calcification and secondary dentin formation.

Malfunction of the endocrine glands has been enthusiastically advocated as the etiologic factor in dental caries; these assertions are based on clinical observations of hypoplastic and dystrophic teeth in cretins and in patients with acromegaly. Similar lesions are said to result from syphilis, exanthems and artificial infant foods. Certain defects in the teeth of dogs, of monkeys and of rats are reported to result experimentally from damage to the endocrine glands, particularly the thyroid and parathyroids.

In a previous paper,[6] it was shown that many of these defects could be duplicated in rat's teeth by the use of defective and deficient diets, with no apparent symptoms of endocrine disturbances. Unless the

7. Howland, J., and Kramer, B.: Calcium and Phosphorus in the Serum in Relation to Rickets, Am. J. Dis. Child. **22**: 105 (Aug.) 1921. Kramer, B.; Tisdall, F. F., and Howland, J.: Observations on Infantile Tetany, ibid. **22**: 431 (Nov.) 1921.

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animal's diet is known and definitely planned, according to modern dietary usage, these conclusions as to the relation of endocrine experimental malfunction and oral disease are useless and misleading.

I am aware of the recent work of McCarrison [8] and Broderick.[9] It seems highly probable that defective endocrine function and disturbed metabolism may be intimately associated with the use of defective and deficient diets, and that any, or all, of these factors may play an etiologic rôle in oral disease; but these correlations are as yet hypothetic.

Until further facts are available, one can think only of the necessity for a proper calcium-phosphorus-organic factor balance in any diet as most important in the formation and maintenance of normal bones and teeth and healthy attaching-tissues.

201 West Madison Street.

## ABSTRACT OF DISCUSSION

### OF PAPERS OF DRS. HOWE, GRIEVES AND SHIPLEY

DR. EUGENE S. TALBOT, Chicago: These papers confirm some research work I did thirty-five years ago. The work of Dr. Howe illustrates better than anything that has ever been published the bone absorption that is due to change in diet. My researches were done on animals, such as cows, hogs, horses, etc. Any animal that is changed from its normal environment and food will have a certain amount of absorption of bone and this absorption is not due to infection or inflammation. Persons who are apparently in good health have absorption of bone tissue at some time or another. The only way we can demonstrate that fact is by an examination of the alveolar process. The alveolar process is a transitory structure. It is not a stable structure like other bones of the body. When the proper food is not taken into the system the alveolar process will begin to absorb. About twenty-five years ago I examined the mouths of men working in mountains in Switzerland, building railroads, and found that the men working in the shafts and tunnels, in dark places, without sunshine and proper air and with poor food, had absorption of the alveolar process. In many cases the teeth became so sore they had to be extracted. I examined thousands of men returning from the Philippines and Cuba and found the same thing. Many similar cases are reported occurring among English soldiers in South Africa at the time of the Boer War. They called it scurvy, but there were no constitutional symptoms. The teeth became sore and loosened. Just what kind of food should be given to one person and what kind to another under similar condition is a question. We do not know what foods will preserve the alveolar process in different persons.

Fig. 6.—Section of macerated molar, alveolus and periodontium involved by gingival disease, decalcified in Mueller's fluid, reduced from photomicrograph, × 40; *a*, coronal dentin; *b*, apexes; *c*, dental pulp; *d*, remaining crests; *e*, osteoporous bone; *f*, fibrous attachments and granulation tissue replacing normal bone and periodontium.

DR. PERCY R. HOWE, Boston: Scientists are beginning to get away from the present day theories of dental caries. As Dr. Shipley has said, we know almost nothing about it, but a few facts were brought out that show the importance of studying the problems from a dietiary point of view.

DR. PAUL G. SHIPLEY, Baltimore: The American diet at the present time is perilously near the danger mark. If you go down to the "quick lunch" at noontime, and watch the tired business man lunch you will see him eat a ham sandwich, and a piece of pie of doubtful origin and drink a cup of coffee. His breakfast in the morning consisted of cereal ready done, alleged cream or pasteurized milk, sugar, more coffee, and toast if he is fastidious and has a lot of time. His dinner consists of muscle meat, steak, chops, or something of that sort (only occasionally a bit of liver), pie or some sort of sweet. With these he has some well cooked vegetable and potatoes, sometimes a salad. Whatever vitamins may be contained in this food, he is hovering close to a very pronounced deficiency in them all. Not only is this the case, but he is taking a diet which is probably extraordinarily bad in the way of its salt content. His steak contains almost no calcium, but is high in phosphorus. The salts of milk form quite a perfect mixture, but nobody seems to know just what happens to milk after the dairyman gets through with it. If you ever have the opportunity to inspect the tanks in which milk is pasteurized, or the cylinders on which milk is dried, you will quickly become convinced that a pronounced change has taken place in the salt content of the milk. Where milk is dried, it is necessary every day to take down the apparatus and chisel off from the sides of it a scale which is nothing more or less than the calcium phosphate which is thrown out of the milk during the process of drying. You are all familiar with the skin which appears on the top of milk when it is brought to the boiling point. More of this material sticks to the sides of the utensil in which boiling is done. Besides protein and some fat, that skin contains a large amount of calcium phosphate, which is lost to the consumer. Dietetics is today a little known field and it seems to me that the best we can do at present in prescribing a regimen is a general, varied diet with, as Dr. Howe has suggested, some fresh, uncooked food every day. Dr. Howe spoke of magnesium and its increase in certain pathologic conditions. By substituting magnesium for calcium in the diet of animals we are able to produce lesions which are very closely related to and, under certain conditions, identical with the rickets seen in children. That it is not altogether unimportant as you will understand when you remember that cow's milk contains a much greater quantity of magnesium than does the breast milk of the mother with which nature intended her child should be fed.

**Relative Importance of Fatal Accidents.**—The importance of fatal accidents among the industrial policy holders of the Metropolitan Life Insurance Company is brought out strikingly by a comparison with certain diseases of primary interest to public health. There were only twenty-nine death claims for typhoid fever, for example, paid in New York in 1921, as compared with 1,022 death claims paid for accidental deaths. During that year, twenty-eight claims were paid on account of measles, ninety-six on account of scarlet fever, thirty-four on account of whooping cough, and 213 on account of diphtheria. Thus we see there was over two and a half times as much mortality from accidents in the city as from all four of these epidemic diseases of childhood.—*Statistical Bulletin*, September, 1922.

8. McCarrison, R.: Studies in Deficiency Disease, Oxford Press, 1921.
9. Broderick, F. W.: The Effect of Endocrine Derangement on the Teeth, Brit. Dent. J. 41:935 (Oct. 15) 1920.

# TREATMENT OF RECURRENT INOPERABLE CARCINOMA OF BREAST BY RADIUM AND ROENTGEN RAY *

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All cases of carcinoma of the breast may be classified in one of five clinical groups, (1) primary operable; (2) primary inoperable; (3) recurrent operable; (4) recurrent inoperable, and the (5) prophylactic group, the last comprising patients referred to us following radical operation of the breast for prophylactic irradiation, there being no obvious evidence of cancerous disease at the time of their admission.

The present paper is a study of recurrent mammary cancer treated in the breast clinic at the Memorial Hospital during the years 1918, 1919 and 1920, comprising a series of 218 patients, practically all of whom have been completely followed up to the present date.

We have included none from the 1921 group, as sufficient time has not elapsed to warrant reporting the results of treatment. The object of this paper is to determine whether or not radiologic treatment of recurrent carcinoma of the breast is justified by the results obtained in this clinic.

Most of the recurrent cases were inoperable at the time of their admission to the clinic. In the recurrent breast group, only six patients have presented themselves, in the years 1918, 1919 and 1920, who could fairly be classified as having operable cases. A small, nonadherent skin lesion, or a small movable node, low down in the axilla, may properly be considered operable, if no other evidence of disease is to be found. Under these circumstances it is a correct procedure to excise the recurrent nodule, irradiation being given both before and after operation. With the presence of several such lesions, however, one must conclude that

Fig. 1.—Recurrence of inflammatory carcinoma; this type of case always extends rapidly.

the disease is probably widely disseminated, and any thought of any operative relief must be discarded. In this event, irradiation is the type of therapy that must be relied on.

A considerable number of cases, namely, ninety-four, were so far advanced at the time of admission that they were obviously hopeless from the outset. The very advanced breast recurrences must be set apart from those cases in which a reasonable palliation, if not a considerable regression of the disease, may be expected. All that one may hope to accomplish for those patients with a far-advanced lesion is a relief of their suffering by adequate amounts of codein or morphin; frequent dressings when foul ulcers are present, and perhaps at times sufficient to satisfy the mind of the patient that

Fig. 2.—Diffuse cutaneous metastases before irradiation.

treatment is still in progress. If we therefore exclude these patients from the whole number of 218 cases, we have remaining 124 patients in whom irradiation as a therapeutic agent could be entertained with a fair hope of some favorable result.

## THE PREVENTION OF RECURRENCE

*Proper Selection of Cases.*—In the recent rapid development of therapy by roentgen ray and radium the surgeon has at times seemed unwilling to relinquish anything in the surgical treatment of cancerous disease. The presence of a carcinoma in a breast is not necessarily an indication for a radical amputation, for a careful physical examination of the patient may reveal some factors which would militate against success by operation. The cases treated surgically must therefore be well chosen if the percentage of recurrence is to be kept at a minimum.

*Preoperative Irradiation.*—It has been the practice at the Memorial Hospital for several years to give a preoperative cycle of roentgen ray in every case of carcinoma of the breast before submitting the patient to operation. As a rule, a period of from seven to ten days is allowed to elapse, between the time of the last irradiation and the day of operation. We believe that the preoperative cycle is of great service in forestalling recurrence, but up to the present time a sufficient number of cases has not been accumulated to furnish a proper comparison with groups of patients in other clinics where the preoperative use of the roentgen ray has been omitted; eventually such a study will unquestionably furnish a proper estimate of the real value of preoperative treatment. In the vast majority of cases we have seen no evidence which would lead us to believe that the preoperative cycle interferes materially with wound healing, or adds to the liability of wound infection.

*Postoperative Irradiation.*—From two to three weeks following operation, every patient is subjected to a

* Read before the Section on Surgery, General and Abdominal, at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

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postoperative series of roentgen-ray treatments over the whole breast and drainage areas. An interval of from six weeks to two months is then allowed to elapse, when a second similar cycle is administered. Sufficient data have already been accumulated at the hospital to make one feel very certain that postoperative treatment prevents certain recurrences and postpones the appearance of practically all recurrences. In addition, it unquestionably prolongs the life of the patient. We feel, therefore, that postoperative irradiation has proved its worth without any reservation.

### RESULTS OF TREATMENT

One may well ask what the average expectation of life is from the time of the first appearance of a recurrent breast tumor without any irradiation. Such a question might imply that all breast cancers are of the same pathologic type and follow a similar clinical course. We know that this is not the case. At present, with the cooperation of Dr. James Ewing, pathologist at the Memorial Hospital, we are engaged in an effort to classify more satisfactorily the various types of carcinoma from a pathologic point of view and to study their reaction to various forms of irradiation. A papillary adenocarcinoma, a tumor well known to be of low-grade malignancy, will certainly permit a longer period of life following recurrence than a rapidly growing cellular tumor. Similarly, a fibrocarcinoma in a woman of 70 may be expected to grow with much less rapidity following reappearance of the disease than a fulminating recurrence complicating pregnancy in a young woman. Nevertheless a gross clinical judgment as to the value of irradiation as a means of treatment for recurrence may be reached if we compare results giving the duration of life from the appearance of recurrence in nonirradiated and irradiated patients.

At the New York Hospital, in the First Surgical Division, where, through the courtesy of Dr. Charles L. Gibson, I was able to follow the breast cases especially, the length of life after recurrence in a series of twenty-two patients on whom a radical amputation had been performed, with no subsequent irradiation, was six and a half months. In the patients in the present series, who have been treated by irradiation following the appearance of recurrence, the length of life after recurrence has been two years and four months, a decided advantage, as one may readily see, in favor of irradiation.

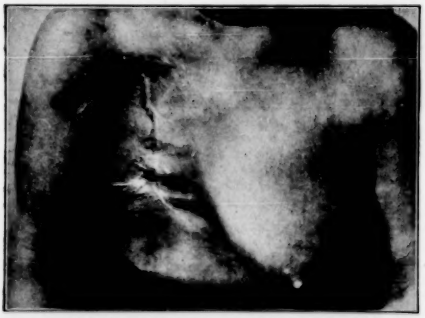

Fig. 3.—Disappearance of cutaneous metastases following irradiation (same case as in Fig. 2).

Of the total of the 124 patients in whom some favorable results from irradiation might be expected, thirty-one are alive at the writing of this report, which is 25 per cent. of the total number. Of the thirty-one patients, twenty-two are doing well, while nine are doing badly. A brief table is given, that the data may be more readily available.

Fig. 4.—Granular degeneration of cell bodies; hyperchromatism of nuclei, and granular degeneration of the stroma.

In general, the more cellular the tumor, the better the response to treatment by irradiation. The younger the woman and the more rapid the recurrence, the poorer is the result to be expected from irradiation.

RESULTS IN THIRTY-ONE CASES

| Case | Operation to Recurrence | | Recurrence to Date | | Total Duration After Operation | |
|---|---|---|---|---|---|---|
| | Years | Months | Years | Months | Years | Months |
| | Patients Doing Well | | | | | |
| 1 | .. | 6 | 3 | 8 | 4 | 2 |
| 2 | 13 | .. | 6 | .. | 19 | .. |
| 3 | .. | 7 | 4 | 10 | 5 | 5 |
| 4 | .. | 3 | 6 | 4 | 6 | 7 |
| 5 | .. | 3 | 4 | 8 | 4 | 11 |
| 6 | .. | 2 | 3 | .. | 5 | .. |
| 7 | 2 | 3 | 3 | 5 | 5 | 8 |
| 8 | .. | 1 | 2 | 9 | 2 | 10 |
| 9 | .. | .. | 3 | 2 | 3 | 2 |
| 10 | 2 | .. | 2 | 10 | 4 | 10 |
| 11 | .. | 3 | 1 | 8 | 1 | 11 |
| 12 | .. | .. | 2 | .. | 2 | .. |
| 13 | .. | 1 | 2 | 1 | 2 | 1 |
| 14 | 1 | .. | 1 | 6 | 2 | 6 |
| 15 | .. | 9 | 1 | 7 | 2 | 4 |
| 16 | 7 | 1 | 2 | 4 | 9 | 5 |
| 17 | 2 | .. | 1 | 8 | 1 | 10 |
| 18 | .. | 1 | 2 | 2 | 3 | 3 |
| 19 | 1 | 7 | 1 | 11 | 3 | 8 |
| 20 | 8 | .. | 1 | 10 | 2 | 6 |
| 21 | 6 | 4 | 2 | 2 | 8 | 6 |
| 22 | 10 | .. | 1 | 10 | 2 | 4 |
| | Patients Doing Badly | | | | | |
| 23 | .. | 3 | 5 | .. | 5 | 3 |
| 24 | 1 | 1 | 3 | .. | 4 | 6 |
| 25 | 1 | .. | 3 | 8 | 4 | 8 |
| 26 | .. | .. | 2 | 10 | 2 | 10 |
| 27 | .. | 11 | 4 | 9 | 5 | 8 |
| 28 | 1 | 6 | 3 | 6 | 5 | .. |
| 29 | .. | 6 | 2 | 3 | 2 | 9 |
| 30 | 4 | .. | 2 | 7 | 6 | 7 |
| 31 | 3 | .. | 2 | 3 | 5 | 3 |

### TYPES BEST SUITED FOR IRRADIATION BY RADIUM

Small localized lesions in the infraclavicular region, or adherent to or involving the chest wall, small localized skin metastases or small accessible nodes are most amenable to treatment by radium itself.

Some of our best results following the use of radium in the recurrent group have been in the infraclavicular region. In some of these cases, applications of a radium pack have resulted in a complete disappearance of the growth. One of the patients has now gone one and a half years with no further evidence of disease to be made out. The details of radium therapy and the methods employed have been fully described in a recent article,[1] and will not be described here.

### TYPES BEST TREATED BY THE ROENTGEN RAY

Recurrences best treated by the roentgen ray include diffuse cutaneous involvement, examples of so-called inflammatory carcinoma, extensive involvement of nodes in the axillary or supraclavicular regions, and mediastinal or pleural metastases, as well as bony metastases, in various parts of the body. The technic employed has been fully described in a recent paper. At present we are still depending mainly on the old type of roentgen-ray machine, and have been reasonably satisfied with the results obtained. Some of the most striking effects have been seen in the treatment of diffuse cutaneous involvement, an area of considerable disease disappearing in a few weeks under appropriate irradiation, leaving an apparently normal skin. In some of these cases, a later examination showed a reappearance of the lesion.

The new 200,000 volt machine now in operation is being used on carefully chosen patients, but sufficient time has not elapsed to make any report on this method of therapy. We are very hopeful that some of the mediastinal and pleural extensions of the disease may yield some encouraging results by this new method of treatment.

The gross and microscopic effects of the treatment of cancerous diseases by radium and the roentgen ray have been described elsewhere.

### CONCLUSIONS

1. As a prophylaxis against the recurrence of breast carcinoma, a careful selection of patients for operation must be made.

2. Preoperative and postoperative cycles of roentgen ray are important prophylactic measures against recurrence.

3. A follow-up in every patient with carcinoma of the breast operated on should be adopted as a routine. No surgeon should operate on a patient with breast cancer without appreciating that an integral part of the procedure is following up the patient, with the idea in view of discovering the appearance of metastases at an early date, permitting the application of irradiation as soon as possible.

4. Properly applied irradiation to recurrent breast carcinoma definitely prolongs the life of the patient.

5. I believe that ultimately, with more complete knowledge and better technic, a still further control of the recurrent phase of this disease may be expected.

128 East Seventy-Third Street.

1 Lee, B. J.: Results to Date in the Treatment of Primary Inoperable Carcinoma of the Breast by Radiation, Ann. Surg., September, 1922.

## FOCAL INFECTION IN THE TONSIL CAUSING A TUBERCULOUS OPHTHALMIA *

CECIL M. JACK, M.D.
DECATUR, ILL.

A study of the etiology of chronic inflammatory conditions of the eye is instructive to both the internist and the ophthalmologist. We are beginning to believe that these conditions are not primary, but secondary to diseased foci in other parts of the body. It becomes the problem of the internist to search out these primary foci. The ophthalmologist has recognized tuberculous ophthalmia for some time, but has been content with such a diagnosis and treatment directed locally, or tuberculin given hypodermically. Those who considered it a secondary condition considered the lungs as a primary source and sought no further. The case I am reporting deals with such a condition. The primary focus was suggested by the history, but determined by a pathologic examination of diseased tissue removed.

Fig. 1.—Section through tonsil: The smaller light areas are the individual epithelioid tubercles; the larger confluent masses are the caseating ones; these are taken from around the infected crypt.

### REPORT OF CASE

*History.*—Miss B., aged 21, referred by Dr. A. E. Prince of Springfield, Ill., for examination and treatment, a diagnosis of tuberculous sclerokeratitis having been made, complained chiefly of an inflamed right eye with failing vision. The father died of diabetes at 72; the mother was living at 60; one brother was living and well. There had been no tuberculosis

* Read before the Decatur Medical Society, Dec. 20, 1921.
* Read before the Section on Ophthalmology at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

in the family. The patient had been delicate as a child, had been bottle fed, and at the age of 3 was operated on by Dr. John B. Murphy of Chicago for tuberculous cervical adenitis. She had many attacks of tonsillitis when older, and a tonsil operation was performed at the age of 14, since which time she has been free from sore throat. At 18, March 16, 1916, she began having an inflammation of the right eye. She consulted several physicians, Dr. Prince being the first (June, 1916) to make the diagnosis of tuberculous ophthalmia. The first attack lasted six months, and was treated by Dr. George Palmer of Springfield with tuberculin. She remained well until March, 1920, when the inflammation returned. She was in Chicago at this time, and consulted Dr. William E. Gamble, who agreed in the diagnosis. His notes show that the vision was normal, and that there was a mild ciliary injection and a cloudy iris, which did not react well to light. The patient then moved to Decatur, and at this time came under my observation. Tuberculin was given, and she seemed to improve at first; but the process took a turn for the worse, the vision became impaired, and the other eye became inflamed. Tuberculin was stopped, and the eyes were put at rest with atropin. The condition continued to grow worse. She now consulted Dr. William H. Wilder of Chicago, who agreed that the process was tuberculous, and it was his opinion that there was some question as to whether the opacities of the cornea would allow her to have even useful vision in the right eye. The vision at this time was 1/200.

*Physical Examination.*—There was marked conjunctivitis of the right eye, a diffuse opacity of the cornea, greater in the lower part, and a marked scleritis, together with uveitis. The vision of the eye was 1/200.

There was considerable conjunctivitis and ciliary injection of the left eye. The cornea and the interior of the eye showed no evidence of any lesion when viewed with the ophthalmoscope; the vision was 20/30.

Between the tonsillar pillars, stumps of tonsil tissue could be seen, especially on the right side. A scar showed on the neck where the tuberculous glands had been removed at 3 years of age. The rest of the physical examination revealed nothing abnormal. Complete chest and gastrointestinal examination was made, including the use of the roentgen ray. This examination was made in January, 1921. The outlook was so unfavorable at this time that I had decided to make a complete reexamination. In taking the history, the patient's mother told me with what difficulty the tonsils were removed —that she had to go back a number of times for treatment and the removal of small pieces. This history and the scar on the neck led me to consider the remaining stumps of tonsil tissue as a focus, and I advised their enucleation.

*Operation and Result.*—At the time of the operation (February, 1921) the vision was so impaired that the patient could not recognize her mother in the same room. The operation was performed under local anesthesia. A piece, the size of a hazelnut, was enucleated from the right side, and from the left three pieces which were completely covered by a slitlike fold were recovered. Dr. A. S. Warthin of Ann Arbor, Mich., made the pathologic report: The tonsil showed a condition of chronic inflammation and hyperkeratosis. It contained great numbers of miliary tubercles clustered around the crypts. The majority of these were epithelioid tubercles, but the larger confluent ones showed caseation and giant cells. No tubercles were found in the germ centers, so that the process was a crypt infection, and not a hematogenous one. One crypt was completely surrounded by a confluent mass of miliary tubercles. From this report one might think that there were two processes at work: an older one as shown by the caseation, the other a more recent one, shown by the miliary tubercles.

Improvement took place rapidly, and now, nine months after the operation, her vision in the right eye has returned to 20/50, and in the left eye to 20/20. The opacities in the right eye have cleared beyond all expectation. The left is a perfect eye.

Fig. 2.—Section through tonsil: germ center on left, which is free from tubercle.

### COMMENT

In searching for similar cases, advantage was taken of the American Institute of Medicine of New York. They made for me a diligent search, but the information obtained was very meager. No case of tuberculous sclerokeratitis could be found in which a pathologic report revealed the presence of tuberculosis in the tonsil.

I record this case, because in searching through the literature no like observation could be found, and I hope that this report will stimulate others to make pathologic examination of the tissue removed when a like condition appears.

134 West Prairie Avenue.

## ABSTRACT OF DISCUSSION

DR. OLIVER TYDINGS, Chicago: Many years ago a patient consulted me and I sent her to Dr. Baldwin of Columbus, Ohio, for operation. He operated and sent me the pathologic report. It was a uterine disturbance, a tuberculous condition. Fifteen years afterward that patient returned with a tuberculous condition of the retina. She was given tuberculin. She has recovered perfectly normal vision. I have seen her within the last six months and her eyes are normal.

DR. WILLIAM C. FINNOFF, Denver: I do not recall ever seeing the tonsil referred to as the primary focus, although there is no reason why it should not be. I believe that in many cases of chronic ocular tuberculosis the primary focus is in the lymph glands, and probably in some cases the primary focus is in the tonsil. Some years ago I examined 200 pairs of tonsils, and I found tuberculosis in four of them, or 2 per cent. The first statement in the abstract, that tuber-

culous ophthalmia is secondary to primary tuberculosis elsewhere, I think is a misstatement, because sclerokeratitis might be a primary condition. Intra-ocular tuberculosis in all instances, unless connected with injury, is secondary. The use of tuberculin in the treatment of a tuberculous eye condition is not specific. Hygienic treatment must be used as well. Tuberculin is just one therapeutic adjunct.

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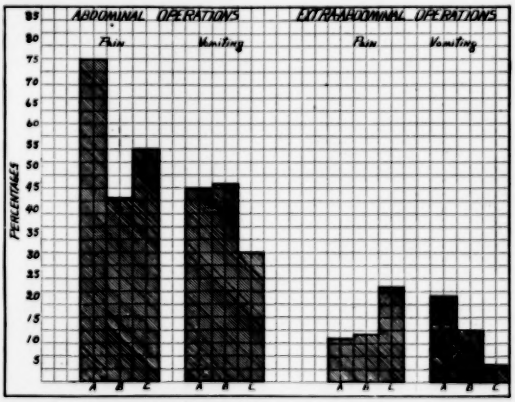
## IMPROVEMENTS IN PREOPERATIVE AND POSTOPERATIVE CARE *

F. B. TAYLOR, M.D.
W. I. TERRY, M.D.
AND
W. C. ALVAREZ, M.D.
SAN FRANCISCO

Until 1919, it was customary at the University of California Hospital to give a dose of castor oil the night before operation, and enemas in the morning. At that time, Dr. Terry discontinued the routine purgation, but left the order for enemas. The general impression about the hospital since then has been that the postoperative recoveries are on the average more satisfactory, and that there is less vomiting, abdominal distention and pain. Several of the operators are enthusiastic over the change, and no one has expressed any desire to return to the old routine. In 1918, Alvarez [1] suggested that it would be wise also to abolish the routine purge usually given on the second or third day after operation. Some of the nurses had remarked upon the fact that not infrequently everything went well until that purge was given, and then everything went wrong. It seemed often to give rise to the vomiting, gas pains and tympanites; or, if they had been present before, it seemed to bring them back. Moreover, there does not seem to be any good reason for giving purgatives to these patients so soon after operation. One cannot expect them to produce fecal material when, for several days, they have had little or no food. The main reason for giving this purge is that, ordinarily, the surgeon feels uneasy about his patient until the bowels begin to move. After that, he feels that the worst dangers are over; but, as the purge can do harm and can cause much discomfort, it would undoubtedly be better sometimes if the operator would restrain himself a bit and wait patiently for Nature.




Incidence of pain and vomiting in patients: *A*, purged before and soon after operation; *B*, not purged before, but purged soon after operation; *C*, not purged before and not purged for four days after operation.

As some of our surgeons felt a certain amount of uneasiness about giving up such a long-established custom, it was thought wise to observe the results of the new technic very carefully and to compare them statistically with those obtained in the preceding period when patients were purged before and after operation.

An effort was made to answer the following two questions: (1) Has it been advantageous to give up the routine preoperative purgation; and (2) has it been advantageous to give up the routine postoperative purgation?

Sixty-two of the people whose postoperative records have been analyzed in this paper were watched and questioned day by day by one of us (F. B. T.). Unfortunately, our conclusions in regard to the control group operated on before 1919 must be based solely on the nurses' records. Most of these are from the University of California Hospital; some are from Lane Hospital, some from the Children's Hospital and some from Mount Zion Hospital. Unfortunately, nurses are often kept pretty busy, and we cannot be sure that every complaint of pain and every attack of vomiting has been charted. However, on comparing the nurses' records in the last sixty-two cases with the notes made independently by Dr. Taylor, we feel that the nurses can be trusted to give a fair idea of the storminess or mildness of a postoperative period. One point in favor of the hospital records is that they were made without bias, i. e., the nurses had no idea of the use to which their notes were to be put. In analyzing these data, no attention has been paid to the patients' symptoms on the day of operation because we must expect some suffering at that time from the effects of the anesthetic and of the incision.

Our conclusions are based on records from 211 patients. Of these, 146 had abdominal, and sixty-five had extra-abdominal operations. The abdominal series includes appendectomies, hernioplasties, gastroenterostomies, cholecystectomies and explorations. As it would obviously not be fair to compare the postoperative symptoms after partial gastrectomies with those after simple hernioplasties, an effort has been made to have the different types of operations represented about equally in the control and the experimental groups. Aside from this, the cases were taken serially, without any selection or discrimination. The extra-abdominal group includes most of the common types of operation performed in a large hospital.

* From the Department of Surgery, University of California Hospital, and the George Williams Hooper Foundation for Medical Research, University of California Medical School.

1. Alvarez, W. C.: Is the Purgation of Patients Before Operation Justifiable? Surg., Gynec. & Obst. 26:651 (June) 1918.

In the analysis, the cases have been divided first into abdominal and extra-abdominal. Naturally, we would expect the patients who have their abdomens opened to suffer more from gas pains and vomiting than do those who do not have them opened. Each of these groups is divided again into three: (1) those operated on before 1919, who had been purged before and after operation; (2) those who had not been purged before but had been purged shortly afterward, and (3) those who had not been purged before and who were given no enema or cathartic for at least four days after operation. The incidence of pain and vomiting in these three groups is shown graphically in the accompanying chart.

The first thing of interest to be noted in the chart is the fact that even the patients who did not have their abdomens opened sometimes had considerable pain and even some vomiting. It shows the large influence of the anesthetic in the causation of these postoperative disturbances.

The salient points brought out are: (1) The omission of the preoperative purge had no definite influence on the amount of vomiting, but it had a decided effect on the amount of pain in the abdominal cases, reducing its incidence from 75 to 42 per cent.; (2) the delay in giving the postoperative purge had a decided effect on the amount of vomiting, reducing its incidence from 45 to 30 per cent. in the abdominal group, and from 20 to 4 per cent. in the extra-abdominal group; (3) in both groups, there was more complaint of pain when the postoperative purges and enemas were withheld. We believe that this means that a number of persons will be more comfortable if given enemas as soon as they are needed to help in the passage of gas. The essential thing is to make the treatment individual and not routine. We still feel it wise, however, in most cases to avoid the use of cathartics for as long a time after operation as possible.

Unfortunately, in going over the records no account was kept of the severity or duration of the vomiting and pain in the various groups. Our clinical impressions lead us to believe that such data might have shown the improved results more graphically than do those which we present here. When one comes to think of it, it is really rather remarkable that 55 per cent. of persons who have within a period of a few days submitted to purgation, to an extensive laparotomy and then to purgation again should (after the first day, as shown above) escape vomiting, and that 25 per cent. should escape abdominal pain. Another 20 per cent. are so constituted, however, that they will have gas pains and vomiting after minor extra-abdominal operations, with no purgation and only a short gas-oxygen anesthesia. The importance of this large personal element is seen in the case of a woman who recently had the gallbladder removed. She had no purgation, and the anesthetic was gas-oxygen. She had no gas or vomiting, and ate with pleasure on the day after operation. At first sight it would seem to be a triumph for the new technic; but it appears that she did just as well seven years ago, when she was well purged and when she had an ether anesthesia for the drainage of the gallbladder.

One point is gratefully noted by the nurses, and that is that they have much less work to do under the present routine. There is less carrying of bed pans; there is less moving of people in heavy casts, and there is less soiling of patients and beds.

As some surgeons have worried a bit about the dangers of fecal impaction or autointoxication, twenty patients were allowed to go for at least six days after operation without receiving purges or enemas. None of these patients showed any ill effects, and several of them had spontaneous bowel movements within the period of observation. In the others, an enema on the sixth day gave good results. Certainly it would seem that a surgeon need have no fear about neglecting his patients' bowels after operation, particularly when little or no food has been given out of which feces can be formed.

The essential point which we wish to make is that in a large hospital with young and inexperienced house officers, the standing orders should call for as little meddlesome interference as possible. If any patient develops symptoms which require the use of purges or enemas, they can always be prescribed; but they should not be made compulsory for the patient who is convalescing smoothly and rapidly. Furthermore, the standing orders must not be such that the very life of a man coming in with an acute intestinal obstruction, a perforating appendix or a gangrenous Meckel's diverticulum must depend on the intervention of some intelligent intern or resident.

Some may feel that our figures do not show enough improvement with the new technic to warrant spending much thought on it. Our answer is that until a few years ago a man might be satisfied if he escaped from an operation with his life and some improvement in his condition. Today, operations have been made remarkably safe. The next thing is to reduce the amount of discomfort attendant on them. If, by any procedure, surgeons can eliminate postoperative vomiting in fifteen out of a hundred cases, and postoperative pain in thirty-two out of a hundred, they will be doing something worth while, something which will redound to their credit individually and collectively.

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## PHYSICAL DEFECTS DISCOVERED IN SELECTIVE DRAFT MEN DURING THE WORLD WAR

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WASHINGTON, D. C.

An unusual opportunity was afforded during the late war to the medical profession of this country to obtain definite information from the reports of the examinations of the selective service men in regard to the physical condition of the young men of this country between the ages of 21 and 30 years.

During the World War, more than 4,000,000 men were enrolled in the military service in the Army, and slightly more than 600,000 in the Navy and Marine Corps. Of the number in the Army, approximately 2,700,000, or more than 70 per cent., came in in accordance with the provisions of the Selective Service Act. Never before in the history of this country had such a large number of men been examined physically for the military service, for whom accurate records of the examinations were preserved. Prior to this time the largest army assembled in the United States was during the Civil War. From the best information available, apparently about 2,300,000 men were enrolled for the Union Army during that war. As will be recalled, the draft act, which was similar to our recent

Selective Service Act, was not enacted until March 30, 1863, and the first call for men effected by the law was that of July 1, 1863. Previous to that time more than 1,250,000 volunteers had entered the military service of the Northern armies. Even after July 1, 1863, the greater part of the men who were mustered in came in as volunteers or as substitutes. Actually, only 2 per cent. of the total forces which were raised for the Union army were draftees, who were held to personal service.

The physical examinations prior to the passage of the draft act were apparently quite inadequate. After the Office of the Provost Marshall General was established, with a medical adviser, efforts were made subsequent to July, 1863, to preserve the records of the physical examinations of all men entering the military service either as volunteers, substitutes or draftees, to obtain from them some statistical material to show the physical condition of the men of this country between the ages of 18 and 45. Since, however, the population of the North had already been depleted of a very large percentage of its best manhood by the volunteer system, the study of the latter records was necessarily made to study the records of the physical examinations, if any were prepared, of the men in the Confederate army.

It was, then, during the World War that our first opportunity was really presented to obtain accurate information in regard to the physical condition of the young men of the country as a whole. Approximately 400,000 men volunteered for the military service prior to the first call for the selective service men in September, 1917. This number was, however, not sufficient to deplete materially the manhood of the country and, consequently, to modify the findings obtained from the study of the physical examinations of the selective service men.

After Dec. 15, 1917, the basic classification of all registrants was first as to their economic availability for military service. All who were found to be available at once were put in Class 1. The total number of these men of the first and second registrations and including all who went to camp prior to Dec. 15, 1917, was 3,764,000. Of this group, 550,000 were rejected by their local boards as physically unfit for all military service. Of those considered physically fit, amounting to approximately 3,200,000, more than 2,700,000 entrained for the military camps.

The physical examinations of these Class 1 men by the local and camp examining boards showed that 47 per cent. had a physical defect of sufficient importance to note on the reports of the examinations. It may be regarded as surprising that a larger number of defective men were not detected; probably there might have been if the examinations had not been necessarily hurried, owing to the military necessity. The various medical specialties were, however, all represented on the examining boards, and they were probably more carefully conducted than any similar set of examinations for military or life insurance purposes at any previous time in the history of this country.

Some of the defects that were recorded were obviously of greater importance from a military standpoint than from that of the ordinary demands of civil life. Practically all were, however, of some importance even to those who did not expect to engage in arduous physical exercise or labor. For example, a man with a pronounced degree of flatfoot, even though he may be able to carry on and maintain himself and family in civil life, is certainly inconvenienced, if not actually handicapped.

The percentage of the defective men varied materially according to the section of the United States from which they were drawn. As is obvious from a very superficial study of any of the decennial census reports of our country, our population is not a homogeneous one. There are well defined areas where the people still show the physical characteristics of the original settlers.

The number of defective men varies by states from 64 per cent. in Rhode Island to 35 per cent. in Kansas. Rhode Island, the most urban of all states, whose population is largely engaged in manufacturing, stood at the top, largely because of the defective and nonresistant stock which has been drawn to that state. Kansas, on the other hand, is largely agricultural, and such of its population as is of foreign origin is of the more robust type. The percentage of the native born in Kansas is 65 per cent., and in Rhode Island, 29.4 per cent.

The French Canadian group had the highest number of defective men (55 per cent.), while that of the native whites of Scotch origin had the smallest (40 per cent.).

The cities furnished a larger percentage of defective men (51 per cent.) than the rural districts (44 per cent.).

Of all Class 1 men, 21 per cent. were found physically unfit for all military service, or, in other words, more than one young man in five was physically unfit to perform any type of military service either at home or abroad.

Not all of the conditions for which men were rejected were very serious handicaps for them in the economic competition in civil life. The majority of conditions were, however, of some importance even to such as followed occupations which do not require physical exertions. The more important causes of rejection were: organic diseases of the heart, 11.5 per cent. of the total causes of rejections; tuberculosis, 9.3 per cent.; errors of refraction, 8.4 per cent.; underweight, 7.6 per cent.; mental deficiency, 4.5 per cent.; hernia, 4.3 per cent.; flatfoot, 3.6 per cent.; defective and deficient teeth, 3.2 per cent.; defective speech and hearing, 2.6 per cent.

Of the large class of diseases, the defects of the bones and organs of locomotion ranked first, with 17.2 per cent. of the total causes of rejections; diseases of the heart and blood vessels, second, 15 per cent.; diseases of the eye, third, 12.6 per cent., and tuberculosis, fourth, 9.3 per cent.

Similar to the variation in the number of defective men by states, the number of men who were rejected varied materially according to the section of the country from which they were drawn. Thus, Rhode Island, which had the largest number of defectives, also had the largest number of men rejected. Forty-two per cent., or almost one half of all between the ages of 21 and 30 who were examined from that state, were rejected, while from Wyoming only 13 per cent. were found to be physically unfit. Here again it was largely the character of the foreign population which had been drawn to Rhode Island, as a result of the character of the industries carried on in that state, though no doubt partly as the result of the industries themselves, which caused this high percentage of rejections.

More men from the cities were rejected (23 per cent.) than from the rural districts and small towns (20 per cent.), owing not only to the environmental condition in the large cities, but also to the character of the foreign population congregated in them.

In the study of the physical conditions of the selective service men, much space was devoted to the study of the defects or diseases noted, since it was the purpose of the study to determine the relative prevalence of the several kinds of defects and diseases in the various sections of the country. Considering, then, the total number of defects rather than of defective men, we find that for each hundred men there were fifty-six defects noted. The excess of the defects over the defective men per hundred was nine; in other words, nine men out of each hundred had two defects which were of sufficient military importance to note.

A defect of some character was noted in 80 per cent. of all men from Rhode Island, while those from Kansas had only a little over half this number (42 per cent.). The physique of the population of the various states varied even to as great an extent as the number of physical defects did. Rhode Island had the largest relative number of men who were below the required military height, the largest percentage of those below the required military weight for their height, and also the largest percentage of those who were regarded as obese. In other words, the population, which was composed to a considerable extent of South Europeans and French Canadians, ran to the extreme. The men from certain of the other states, and especially from the North Central and Northwestern states, were much better proportioned.

The average height or stature of 1,000,000 men was 67.49 inches (171.4 cm.). The shortest men came from Rhode Island (66.4 inches, or 168.6 cm.), the tallest from Texas (68.4 inches, or 173.7 cm.). Considering the population groups, the tallest men came from the mountain area of North Carolina. These men were of Scotch descent and averaged 68.67 inches (174.4 cm.).

The average weight for the United States was 141.54 pounds (64 kg.). The heaviest men were from South Dakota (146.96 pounds, or 67 kg.), and the lightest from Rhode Island (136.44 pounds, or 61.9 kg.). Considering the sections the lightest men were from the section of Florida which had a large percentage of West Indians and Spanish (136.23 pounds, or 61.8 kg.). Of the total rejections, 7.6 per cent. were because of underweight, while a little less than 1 per cent. were from underheight, the latter being only a military defect and not an economic one. The relation of weight to height is most important. Thus, among the men who were sent to the military camps and were rejected there on account of pulmonary tuberculosis, 82.6 per cent. were under the required weight for their stature. If greater attention could have been directed by the local boards to the relative weight, probably a large percentage of such cases could have been detected.

Among the population groups, the greatest number of defects was noted for the French Canadians (68.4 per cent.) and the least among the Mexicans (47.2 per cent.), closely followed by the native whites of Scotch origin (47.3 per cent.). In each hundred men from the urban districts there were sixty-one defects noted, and from the rural, fifty-three. Chicago (sixty-two) and Boston (sixty-nine) were above the average for the cities, while Philadelphia (sixty) and New York (sixty) were both below the average.

Of the individual defects which were recorded most frequently in the men examined, the principal ones occurred in this order: flatfoot, 11.7 per cent.; venereal diseases, 5.7 per cent.; hernia, 4 per cent.; refractive errors of the eye, 3.3 per cent.; organic disease of the heart, 3.1 per cent.; underweight, 3.1 per cent.; tuberculosis, 2.5 per cent.; hypertrophied tonsils, 2.3 per cent.; defective teeth, 1.4 per cent.; mental deficiencies, 1.2 per cent.

It is not necessary for me to say that a great number of the defects mentioned are easily corrected. The fact that they were not corrected diminishes the man's economic value and, in a very material way, lessens his happiness in life. Nor is it necessary to point out the measures which could be taken for their correction. Suffice it to say that the physical examination of our children in public school and their supervision by health officers while in school; civilian training camps where the young men undergo careful physical survey; encouragement in life extension work, which includes the periodic examination of all people after they have reached the age of 40; and general education of the public with reference to the venereal diseases stand among the important measures.

## THE LETHAL AGENT IN ACUTE INTESTINAL OBSTRUCTION

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The continuous appearance in clinical journals of papers which purport to discuss the cause of death in acute intestinal obstruction, but which entirely ignore or misconstrue the important experimental work carried on in the last few years, especially by L. R. Dragstedt and his co-workers, suggests the desirability of a brief review of this field. Particularly vexed have been the questions of the nature of the poison (for all workers agree that a poison taken up from the obstructed intestine is the lethal agent) and its source.

Whipple and his collaborators [1] have shown that the formation of a closed loop of the upper intestine, by double section, infolding the cut ends of the isolated segment after thorough washing, and reestablishing continuity of the remaining intestine by anastomosis, is equivalent to a simple obstruction. An animal on which such an operation has been performed dies in a manner typical of obstruction, and in the loop there accumulates a fluid which, on intravenous injection into a second animal, leads to similar symptoms. The poisons may be developed, then, in the absence of all foods, bile and pancreatic and gastric juices, and in the absence of a secretion peculiar to any one portion of the intestine; the ultimate source must be the mucosa and its products, or the bacteria.

### NATURE OF THE OBSTRUCTION POISONS

Consideration of the chemicals present in these indicates that the only known toxic agents which might be formed by their lysis are the protein decomposition products. Oxycholesterol, derivatives of the glucosamins of mucin, and cholin and neurin from lecithin might be formed, and contribute to the general toxicity of loop fluid; but they are not toxic to the

1. The literature is reviewed by Gerard, R. W.: J. Biol. Chem. 52: 111 (May) 1922.

same extent or in the same manner as the whole fluid and are, therefore, of secondary importance. The phenols and mercaptans formed from proteins occupy a similar position.

More important are the secondary derived products —proteoses, peptones, kyrins, Vaughan's toxic fraction and the vasodilatins—and the amins, which are especially formed by bacterial action, and include many highly poisonous substances. Bacterial exotoxins are not present, and the endotoxins most probably are protein split products. Vaughan's toxin so closely resembles histamin that Vaughan has suggested the identity of the two.

TABLE 1.—EFFECT OF INTRAVENOUS INJECTION OF OBSTRUCTION FLUID, HISTAMIN AND PROTEOSE

| Object Affected | Effect of Intravenous Injection in Dog: Obstruction Fluid | Histamin |
|---|---|---|
| Blood pressure | Fall, rise above normal and prolonged fall | Fall, rise above normal and prolonged fall, in cat |
| Temperature | Prolonged fall | Prolonged fall |
| Respiration | Rapid, then slow and labored | Rapid, then slow and fails |
| Heart | Slowed | Slowed |
| Pupils | Dilated | Dilated |
| Secretion | Increased vomiting, salivation, bloody diarrhea pancreatic secretion* | Increased vomiting, salivation, bloody diarrhea pancreatic secretion |
| Lymph flow | Rapid | Rapid |
| Coagulability of blood | Decreased | Slightly decreased; proteose gives a decrease |
| Concentration of blood | Increased | Increased |
| Skeletal muscle | Tremors and rigidity | Rigidity |
| Cats | Resistant | Resistant |
| Guinea-pigs | "Histamin shock" with dyspnea | "Histamin shock" with dyspnea |
| Immunity | Nonantigenic | Nonantigenic; proteose probably nonantigenic |
| Intestinal strip | Contracts | Contracts |
| Necropsy | Great engorgement of intestinal mucosa, especially in the duodenum | Great engorgement of intestinal mucosa, especially in the duodenum |

* L. R. Dragstedt, personal communication to the author.

Table 1 shows that obstruction fluid, histamin and proteose are almost identical pharmacologically.

The chemical properties of these three poisons, however, show marked differences, as indicated in Table 2.

Chemical analysis of obstruction fluids has substantiated these conclusions. Nesbitt found neurin and cholin in simple obstruction fluid after feeding a lecithin-rich diet. Kukula isolated a pentamethylene diamin. Roger reported the presence of a proteose in obstruction fluid, and Whipple and his co-workers more completely identified a primary heteroproteose. Sweet, Peet and Hendrix described a proteose and a "cholin-like" substance. Histamin has been isolated from feces, intestinal contents and intestinal mucosa, and from obstruction fluids in the dog and in man.

### FORMATION OF OBSTRUCTION POISONS

The presence of histamin and proteose among the obstruction poisons indicates strongly a bacterial agency in their formation; there is evidence that bacteria play an essential rôle in the genesis of these poisons.

Bacteria multiply prodigiously in the obstructed bowel; the putrefactive strains, such as *Bacillus coli*, overgrow all others, and the contents become alkaline, favoring putrefaction. When bacterial growth is checked, obstruction of the intestine is not attended by the usual fulminating symptoms but, if continuity is reestablished, is entirely compatible with health. Dragstedt has pointed out the absence of toxic symptoms in cases of congenital atresia prior to bacterial invasion. Davis and Stone and others, by means of Thiry's fistula, allowed the secretion of an isolated loop of bowel to drain to the surface. The secretion was nontoxic when fresh but, after incubation for eighteen hours, produced typical symptoms on injection into a dog. When bacterial growth was prevented, the secretion remained innocuous. The dogs with such draining loops lived in health, but died if the opening was occluded. Murphy and Vincent found that the jejunum of a dog incubated in vitro with its blood developed the typical obstruction poisons.

Murphy and Brooks [2] distended the gallbladder of a dog with sterile blood, and ligated the duct. The whole became necrotic, but no general symptoms appeared, nor did the contents become toxic to a second dog. When a small amount of jejunal contents was added to the blood distending the gallbladder, the animal died from the usual toxemia, and the bladder contents produced typical shock on intravenous injection into another dog.

Still more significant are the results which Dragstedt [3] has secured. The closed loop of the upper jejunum in dogs is always fatal within three or four days. If the usual operation is performed but the isolated segment, instead of being closed, is washed and left open in the peritoneal cavity, those dogs which survive the peritonitis remain well. In a few weeks the loop is entirely sterilized, and may then be closed as usual. Such a loop becomes distended, and may even rupture, with a nonpoisonous fluid, and causes no toxic symptoms. Partial or entire blocking of the blood supply is attended by no more serious consequence than resorption of the isolated loop, though the same blocking of the normal septic intestine is inevitably fatal.

TABLE 2.—CHEMICAL PROPERTIES OF LOOP POISON, HISTAMIN AND PROTEOSE

| Reagent | Loop Poison | Histamin | Proteose |
|---|---|---|---|
| Heat | Stable | Stable | Stable |
| Acid; refluxing with 20 per cent. hydrochloric acid | Stable | Stable | Hydrolyzed |
| Alkali | Stable | Stable | Hydrolyzed |
| Trypsin | Stable | Stable; slow loss | Possibly stable in a heteroproteose form |
| Erepsin | Stable | Stable | Probably hydrolyzed |
| Alcohol | Part soluble Part insoluble | Soluble | Insoluble |
| Half saturated ammonium sulphate | Part soluble Part insoluble | Soluble | Insoluble |
| Collodion membrane | Diffusable in part | Diffusible | Nondiffusible |
| Passage through liver | Part destroyed | Part destroyed | Part destroyed |

2. Murphy, F. T., and Brooks, Barney: Intestinal Obstruction, Arch. Int. Med. **15**: 392 (March) 1915.

3. Dragstedt, L. R.; Moorhead, J. J., and Buraky, F. W.: J. Exper. Med. **25**: 421 (March) 1917. Dragstedt, L. R.; Dragstedt, C. A.; McClintock, J. T., and Chase, C. S.: J. Exper. Med. **30**: 109 (Aug.) 1919.

### ABSORPTION OF OBSTRUCTION POISONS

The contents of an obstructed bowel, then, become poisonous as a result of the formation of histamin and allied proteolytic products by the action of putrefactive bacteria. These poisons produce, on injection, symptoms identical with those of acute ileus. The same toxic fluids introduced into a normal intestine, however, are quite innocuous, and must be, therefore, either rejected by the mucosa or destroyed before reaching the systemic circulation. This has led many workers to postulate the production of an obstruction poison by the mucosa itself, from which the majority passes directly into the blood, while some is fortuitously discharged into the lumen—whence the toxicity of the fluid.[4]

Since the poisons are formed by bacteria, the assumption of their parallel production by metabolic activity of the mucosa is entirely unnecessary, and indeed the absence of any toxemia from distended sterile loops of intestine militates against this conclusion. Extracts of obstructed intestine mucosa are toxic, though less so than the contents, and contain histamin. It may be shown that poisons formed in the lumen are absorbed from the bowel under obstruction conditions.

Closed loops of the duodenum are usually fatal in from one to two days, of the upper jejunum in from two to four days, and of the lower jejunum in three or more days, while loops of the lower ileum and colon are entirely compatible with life. The contents of a closed loop at any level are typically poisonous, so that the differences at these levels lie in the absorption of the poisons. A closed loop of colon opened many months after its production is but slightly, if at all, distended and the mucosa is uninjured. A loop of jejunum examined at necropsy is invariably greatly distended, unless it has ruptured, and the mucosa is gangrenous over large areas. Such an injured mucosa might well lose the very special ability of selective absorption, and permit the influx of poisons normally prevented from reaching the blood. The duodenum in particular is vulnerable, for slight distention at any point suffices to compress the duodenal vessels, which follow the mesenteric margin, against the serosa, and leads to rapid degeneration of the mass of the loop mucosa.[5] The more rapid fatality of the higher obstructions would thus be correlated with the greater secretion of the upper portions of intestine and consequent early distention, anemia and necrosis of the mucosa.[6]

Hartwell and Hoguet[7] early observed that dogs starved for four days previous to a duodenal obstruction survived it for more than two weeks. The secretion was reduced by inanition. More striking results were obtained by Dragstedt in washing the isolated loop, before closing, with astringent solutions, such as ether, alum, and tannic acid, which enabled a large percentage of dogs to survive indefinitely. The contents of these loops were septic and toxic, but the whole loop was only slightly distended, and the mucosa was intact.

Murphy and Brooks,[8] in an acute experiment, introduced obstruction fluid into a loop of normal intestine. The animal showed no symptoms, nor were its body fluids toxic to another dog. When the fluid was introduced into a loop under a pressure of 80 mm. of mercury, the animal died in six hours, and lymph collected from its thoracic duct was lethal to a second dog on intravenous injection. Similar results were obtained by directly blocking the venous return from the loop. Of interest in this connection is an observation by Schloss,[9] who found a histamin-like substance in the blood of infants suffering from acute intestinal intoxications. The intestine of the infant possesses the selective powers of the adult organ in a very minor degree.

The evidence is thus clear that death in acute ileus results from a systemic poisoning by histamin and other putrefaction products formed in the lumen of the obstructed bowel by bacteria, and passed through the mucosa (seemingly into both blood and lymph) when the latter has become asphyxiated and lost its vital powers of selection, subsequent to distention and interference with its normal circulation.

### CLINICAL COROLLARIES

A few points of clinical value may be indicated. McQuarrie and Whipple[9] have shown that obstruction is attended by depressed functioning of the kidneys due to direct action of the obstruction poisons. This initiates a vicious cycle—the more the poisons accumulate, the less the possibility of their excretion. This may be relieved by treatment with large amounts of saline, e. g., by hypodermoclysis, which is doubly effective, diluting the poisons and promoting diuresis and, therefore, elimination of the poisons. The striking results of Luckhardt indicate the possibilities of this therapy. These measures are of further value in relieving the body dehydration resulting from the intense vomiting and diarrhea of obstruction.

The value of early operation in acute obstruction is well known. Finney[10] reports only 5 per cent. fatality for operations performed within five hours of the obstruction. Early and continued lavage, possibly with astringent and amin precipitant solutions, or drainage is indicated. The drainage tube must be sufficiently stout to resist compression by the abdominal muscles, a point often neglected, with fatal results.

Following the injection of sufficient quantities of histamin, an animal passes into severe and fatal shock. Dale has shown that a normal cat will resist intravenous injection of more than 10 mg. per kilogram. Etherization for two hours lowers the resistance so that more than half an hour later 1 or 2 mg. of histamin, or even

4. As evidence for this view, it has been shown (Whipple, G. H.; Stone, H. B., and Bernheim, B. M.: J. Exper. Med. **17**: 307, 1913. Whipple, G. H.: Contributions to Medical and Biological Research, New York **2**: 1065, 1919) that when the mucosa is killed by sodium fluorid, a closed loop will not prove fatal. This may easily be the result of decreased secretion into, and absorption from, the lumen. The contents of such a loop cause a marked fall in blood pressure on intravenous injection.

5. Dragstedt, L. R., and Dragstedt, C. A.: Acute Dilatation of the Stomach, J. A. M. A. **79**: 612 (Aug. 19) 1922.

6. Van Zwalenburg showed that a pressure of 80 mm. of mercury in the lumen of the intestine for one hour led to degenerative changes in the mucosa. There is much evidence to indicate that these poisons may be absorbed in slight amounts even by the normal intestine, especially the small one. In the colon, the contents are not mixed about, and when the contents are solid, little absorption is possible. Also much of the poison is destroyed by further putrefaction (Donaldson, A. N.: Relation of Constipation to Intestinal Intoxication, J. A. M. A. **78**: 884 [March 25] 1922). Dragstedt has noted toxic conditions of a chronic nature (listlessness, sticky coat, epileptiform seizures, and the like) following the production of a closed loop of small intestine 2 or 3 feet long. The putrefaction here is intense, and sufficient absorption of poisons occurs over the large area of mucosa to cause symptoms, even though the distention is slight and the mucosa apparently normal. The well known tetany and death which follow the feeding of meat to dogs with Eck's fistula is significant in this connection; also the recent observations of Luckhardt (Proc. Soc. Exper. Biol. & Med. **19**: 121, 1921) that parathyroidectomized dogs, kept healthy and without tetany for months by intravenous saline injections, pass into tetany at once when fed meat, especially when given putrid meat or when a stasis is induced.

7. Hartwell, J. A., and Hoguet, J. P.: Am. J. Med. Sc. **143**: 357, 1912; Experimental Intestinal Obstruction in Dogs, J. A. M. A. **59**: 82 (July 13) 1912; Hartwell, J. A.: J. Exper. Med. **18**: 139, 1913.

8. Schloss, O. M.: Proc. Soc. Exper. Biol. & Med. **18**: 101, 1921.

9. McQuarrie, I., and Whipple, G. H.: J. Exper. Med. **29**: 397 (April) 1919.

10. Finney, J. M. T.: Surg., Gynec. & Obst. **32**: 402 (May) 1921.

less, proves fatal on injection. Nitrous oxid and oxygen anesthesia does not lower the resistance. Since in acute obstruction the body is continually receiving histamin and allied substances, ether is distinctly to be avoided. The resection should be performed under nitrous oxid or local anesthesia if possible. Otherwise drainage should be established with the patient under one of these forms of anesthesia, and the more elaborate operation delayed until, by these other measures, the toxemia has been reduced.

Hull and Rettger, and others have shown that the growth and action of the putrefactive bacteria is optimal in slightly alkaline mediums. The fermentative flora of the intestine, however, are distinctly favored and will displace the others in an acid medium. Replacing meat in the diet as much as possible by carbohydrates, especially lactose, which is slowly hydrolyzed and absorbed, favors the aciduric organisms, which produce acids by the fermentation of the sugars; and practically eliminates putrefaction. *Bacillus coli* does not disappear, but acts as a fermenter while these conditions are maintained. Cannon and Dragstedt have obtained favorable results with rats in this manner. The administration of lactose, besides the establishment of drainage, may, therefore, prove valuable in reducing the toxemia prior to the actual removal of the obstruction.

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## TOXIN-ANTITOXIN IMMUNIZATION AGAINST DIPHTHERIA *

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The development of antitoxin in the bodies of animals injected with diphtheria toxin is one of the best established of facts. Since von Behring and Roux announced the results of their investigations, large numbers of horses have been injected with toxin and have developed abundant antitoxin.

Unaltered diphtheria toxin has been used also as a stimulating injection in man, but it has to be used in very small and repeated doses; otherwise it would produce annoying local reactions and possibly even paralysis. It was early realized that if we ever attempted actively to immunize children, the advantage would be great if we could replace pure toxin with an altered toxin which would be equally effective and without danger.

### USE OF TOXIN MODIFIED BY ANTITOXIN FOR ACTIVE IMMUNIZATION IN ANIMALS

The earliest knowledge that injections of toxin almost neutralized by antitoxin are capable of stimulating in animals the production of antitoxin came quite accidentally. As is well known, antitoxin can be detected and measured only by its characteristic of neutralizing toxin. The degree of neutralization of the toxin by the antitoxin is determined by the injection of a definite quantity of the mixture into guinea-pigs. The testing of the potency of the drawings of the serum from the various horses under treatment is likely to leave a certain proportion of the test animals alive because of their having received subcutaneously toxin with an overneutralizing amount of antitoxin. The attempt to use these treated guinea-pigs several months later revealed the fact that many of the animals were immune. Investigation proved that this antitoxin immunity did not appreciably develop until the lapse of from four to six weeks.

Babes, in 1895, was the first to inject experimentally diphtheria toxin-antitoxin mixtures and to appreciate that not only slightly underneutralized diphtheria toxin, but also that which was slightly overneutralized, would bring about the development of antitoxin in animals.

A little later (1896), but independently, I made the same observations. Wernicke, in 1895, noted that guinea-pigs actively immunized by the injection of living bacilli and antitoxin gave birth to immune young, and that antitoxin was present in both the mothers and their offspring for at least eight months. In the winter of 1896, I began to use this knowledge concerning much overneutralized toxin practically, in starting the immunization of the horses which were employed for the production of diphtheria antitoxin.

I noted that the use of large amounts of overneutralized toxin was a safe and rapid method of beginning immunization. In the same year, Dreyer and Madsen made systematic investigations as to the effect of different degrees of overneutralization on the effectiveness of the toxin-antitoxin to stimulate antitoxin.

In 1903 I published results showing that an injection into a horse of 10,000 lethal doses of toxin which has been just neutralized usually causes the development of about 60 units of antitoxin per cubic centimeter of serum, while the same toxin neutralized sixfold usually causes the production of about three units.

In 1905, Theobald Smith studied the duration of immunity in guinea-pigs which had received toxin-antoxin. He corroborated the work of Wernicke, and extended to two years the time during which guinea-pigs retain immunity.

The fact that the antitoxin would take a number of weeks to develop in those not originally possessing it made it not applicable to persons in immediate danger of infection. Therefore, in the presence of diphtheria, immunizing antitoxin injections would still be necessary in families and institutions. In the absence of any simple test for determining which individuals had natural antitoxin and which did not, we had to inject many unnecessarily, if active immunization were to be attempted. The success of the treatment would also be difficult to determine. These considerations delayed its application in man. On the other hand, we had the growing conviction that, wonderful as were the results of antitoxin, diphtheria could never be conquered by it. The combination of the ever present carrier of bacilli, and the slowness of people to recognize diphtheria when it develops, still permits the occurrence of 50 per cent. more diphtheria than we would otherwise have, and perhaps one sixth of the number of deaths. Furthermore, vital statistics revealed that diphtheria mortality and morbidity had not decreased during the last five years; for instance, in the state of New York, the mortality was 12.8 in 1917 and 16.8 in 1921.

Only one means presented itself to our minds which gave any hope of making another distinct advance. This was active immunization by means of toxin injections.

In 1913, the application by Schick of the intracutaneous neutralization test to detect antitoxin immunity

* Read before the Section on Preventive and Industrial Medicine and Public Health at the Seventy-Third Annual Session of the American Medical Association, St. Louis, May, 1922.

gave a simple means of testing for antitoxic immunity before and after the injections.

### PRACTICAL APPLICATION OF DIPHTHERIA TOXIN-ANTITOXIN IN MAN

Von Behring, May 8, 1913, reported the injections of neutralized toxin in a small number of persons. Before giving the injections he used no Schick tests or other means of testing whether or not the subjects were already immune. He demonstrated by repeated guinea-pig tests that there was a quick development of antitoxin in many of those treated, but in others no antitoxin was detected at the time the tests were made. It is now known that the retests were made too soon to detect the development of antitoxin in those who had none at the time of the injections. The duration of the immunity was not investigated. Although von Behring referred to the toxin-antitoxin mixture as his discovery, what he used was exactly what several of us had described and used in experimental animal immunization during the last eighteen years. His real contribution was the demonstration in a few human beings of the safety of the injections.

The example of von Behring led Hahn and Summer shortly afterward to offer the toxin-antitoxin to the 4,300 children of six villages in the district of Magdeburg, where diphtheria was endemic. Of the 1,097 children injected, 633 received the full series of three injections; 255 received two injections, and 209 received one. The Schick test was not used before or after treatment, so it is impossible to know how many of the injected children possessed natural antitoxin and how many of the others developed it.

There was no difference in the development of cases of diphtheria among the treated and the untreated portion during the first two weeks following the completion of the injections; but after that time there was a lessening of the number in the treated portion. The immunization had no apparent effect on freeing carriers from infection. Until after the war, no further observations or immunizations were made in Europe.

Oct. 21, 1920, Bieber published his study of the histories of all the children mentioned above. Fortunately, he was able to trace the majority of those who were living in the district at the time of the injections. He reported that during the six years, 15 per cent. of those who had not received injections had had attacks of diphtheria; that only 4.6 per cent. of the total number inoculated, and only 3.3 per cent. of the fully treated had developed it. Because of the war, many of the diagnoses were not confirmed by cultures, and he believed that some of the cases were almost surely not diphtheria. Two of the incompletely treated children had died from diphtheria.

Bieber concluded that although the toxin-antitoxin had not given a lasting immunity to all who had received the injections, the results were satisfactory in that the percentage of persons having diphtheria was very much less in the inoculated portion than in that uninoculated. He believed that the results should stimulate more extensive trials.

### PERSONAL OBSERVATIONS

Before and since the period of the war, the practical value of the toxin-antitoxin injections was subjected to continuous investigation by workers in the Bureau of Laboratories of the Department of Health of the City of New York. The results obtained and the conclusions drawn are as follows:

### THE ANTITOXIN RESPONSE AND THE PERMANENCE OF THE IMMUNITY ACQUIRED

Late in 1913 we began the practical use of toxin-antitoxin injections for the immunizing of children against diphtheria, and established the facts that the procedure was harmless and that after three injections about 80 per cent. of those individuals possessing no antitoxin or insufficient antitoxin to protect from diphtheria, developed immunity. Those showing positive Schick reactions and receiving two injections, developed negative Schick reactions in about 70 per cent.; those receiving one injection, in about 50 per cent. We soon realized that the most important problem was the duration of the antitoxic immunity in those that had developed antitoxin. A satisfactory answer to this question required that immunizations be carried out in institutions where the children would be under observation for a number of years. A few suitable institutions were immediately sought for and obtained by Dr. Abraham Zingher and, later, additional ones were added by Dr. M. C. Schroder. We have thus been able to keep under supervision for from three to six and one-half years about 10,000 children. From year to year, Drs. Zingher and Schroder have been reapplying the Schick test to these original children. With a few of them we are now in the seventh year of observation. We have had no serious immediate or late after-effects. In these institutions diphtheria has not developed in any child who has received three injections. Eighty per cent. of those who received three inoculations have developed sufficient antitoxin within three months to prevent the positive Schick reaction. Fifty per cent. of the remainder developed antitoxic immunity sufficient to give the negative Schick test before the end of the first year. The remainder received then or later a second series of injections, and all of these concerning whom we have information became immune. In some later investigations, we have encountered occasional children who resisted even two series of injections.

TABLE 1.—RECORD OF PERSONS ORIGINALLY GIVING POSITIVE SCHICK REACTIONS, NOV. 16, 1915; INDIVIDUAL RESULTS FOR FIVE AND SIX YEARS AFTER THREE TOXIN-ANTITOXIN INJECTIONS GIVEN ON NOV. 30 AND 25, AND DEC. 3, 1915

| Observation Child No. | Retests | | | | | |
|---|---|---|---|---|---|---|
| | Jan. 29, 1916 | June 29, 1916 | January, 1917 | January, 1919 | January, 1921 | January, 1922 |
| 1 | − | − | − | − | − | − |
| 2 | − | − | − | − | − | − |
| 3 | − | − | − | − | − | − |
| 4 | ± | − | ± | − | − | − |
| 5 | − | − | − | − | − | − |
| 6 | ± | − | − | − | − | − |
| 7-12 | − | − | − | − | − | − |
| 13* | − | ± | − | ±† | − | − |
| 14 | − | − | − | − | − | − |
| 15 | − | − | − | − | − | † |
| 16 | − | − | − | − | − | |
| 17 | − | − | − | − | − | |
| 18 | ± | − | − | − | − | |
| 19 | ± | − | − | − | − | |
| 20* | ± | − | ± | ±† | − | |
| 21 | ± | − | − | − | − | |
| 22-26 | − | − | − | − | − | |
| 27 | + | − | ± | − | − | |
| 28 | − | − | − | − | − | |

* Given series of three injections.
† Fourteen of the twenty-eight present in 1921 had left.
± indicates a very faint Schick reaction; ±, a very moderate Schick reaction.

As an illustration of the methods used in retesting the children from year to year in the institutions, Table 1 is given. In it are entered the results of frequent Schick tests

of twenty-eight children who, having given positive Schick reactions, received immunizing injections and later gave negative reactions; these children remained in the institution and continued negative during five years. Of these, fourteen remained and continued negative for six years and ten continued negative for six and one-half years.

### DISCUSSION OF RESULTS OF TESTS

Twenty-two became negative within two months, twenty-seven in seven months; twenty-five of these remained negative during the five years. One of the remaining became finally immune and two, Numbers 13 and 20, required a second series of injections in 1919.

In cases such as 13 and 20 it is impossible with our present knowledge to determine whether the difference in the degree of reaction is wholly due to a fluctuation in the amount of antitoxin present or whether the deviation from the negative is partly due to a variation in the strength of the toxin used in the Schick retest or to error in the placing of the supposedly intracutaneous injection.

The results in the twenty-eight children are representative of those obtained in the other institutions. With one or two exceptions among hundreds of children, all who did not respond to the first series of injections became negative to the Schick test after the second treatment. The 1916 and 1917 tests were made by Dr. Zingher, the latter one by Dr. Schroder.

TABLE 2.—RESULTS OF ATTEMPTED IMMUNIZATION AS SHOWN BY SCHICK TEST THREE OR MORE MONTHS AFTER TREATMENT WITH THREE INJECTIONS OF TOXIN-ANTITOXIN; CHILDREN FROM PUBLIC SCHOOLS OF BROOKLYN; TESTS BY DR. SCHROEDER

| Number of School | Location | Total Number Children Retested | Positive Cases Which Became Immune | Per Cent. | Length of Period Between Treatment and Retest |
|---|---|---|---|---|---|
| 158 | Belmont Ave. near Warwick St. | 370 | 254 | 68.7 | 3 mos. |
| 156 | Sutter Ave. near Barrett St. | 329 | 292 | 88.8 | 3 mos. |
| 173 | Penn. Ave. near Liberty Ave. | 163 | 144 | 88.9 | 4 mos. |
| 29 | Columbia and Amity Sts. | 57 | 45 | 79.0 | 5 mos. |
| 142 | Henry and Rapelye Sts. | 127 | 112 | 88.0 | 5 mos. |
| 50 | S. 3d St. and Driggs Ave. | 82 | 74 | 90.3 | 6 mos. |
| 16 | Wilson Ave. near Bedford Ave. | 241 | 216 | 89.7 | 6 mos. |
| 72 | New Lots Road | 199 | 195 | 98.0 | 6 mos. |
| 109 | Dumont Ave. near Sackman St. | 141 | 99 | 70.0 | 6 mos. |
| 4 | Berkeley Pl. near 5th Ave. | 103 | 91 | 88.4 | 7 mos. |
| | Total | 1,812 | 1,522 | 83.9 | |

As an example of the results following the injections in the schoolchildren, Table 2 is given.

The knowledge that about 80 per cent. of the children who possess no diphtheria antitoxin develop it after three injections of toxin-antitoxin and with very few exceptions retain it for at least six years, and that those who partially fail to respond do respond after a second series of treatments, affords us ground for the belief that we have a practical means of immunizing the child population of the country. Even though the belief that this change in the antitoxin content of these children is a permanent one should prove erroneous, it would merely mean that one would have to repeat the injections not oftener than once in six years.

### PERMANENCE OF NEGATIVE SCHICK REACTION IN PERSONS WHO DEVELOP NATURAL IMMUNITY

At the Convent of St. Dominick, ninety-four of the original children who had given Schick negative reactions with Dr. Zingher's tests remained for five years. These children were retested at the two and five year periods by Dr. Schroder. In both retests ninety of these children showed negative reactions, while four showed positive reactions in one or the other retest. It is an interesting point as to whether the children who were negative originally had lost their antitoxin or whether the apparent change in reaction was due to other causes. We know from making the double Schick test (that is, one test on each arm) on several hundreds of children, that routine tests made even by an expert are likely to show occasional errors. In this test series, about 2 per cent. of the children showing positive tests had them only on one arm. There was, therefore, no doubt that in 2 per cent. of these children, one of the two injections had been inserted too deeply so that the toxin did not remain in the skin and therefore could not produce the reaction. We know also that slight differences in the strength of the toxin solution cause a borderland case to give either a negative or a positive reaction. Differences in technic and in toxin solution possibly account, therefore, for the apparent change in one or all of the four cases. On the other hand, we know that the amount of antitoxin in an individual changes somewhat from time to time, so that it is possible that one or all of the four subjects might have reacted at one time and not at another to the standard Schick toxin properly given.

Whatever the explanation of the apparent change in four cases, we have the remarkable fact that nearly 96 per cent. of the originally negative children remained negative during five years. Practically the same results have been obtained in all the other institutions.

TABLE 3.—DEATHS FROM DIPHTHERIA GROUPED BY SEX AND AGES, CITY OF NEW YORK, YEAR 1917

| Age | Males | Females | Total | Per Cent. |
|---|---|---|---|---|
| Under 1 year | 73 | 60 | 133 | 11+ |
| 1 to 4 years inclusive | 390 | 319 | 709 | 60+ |
| Total under 5 years | 463 | 379 | 842 | 72+ |
| 5 to 9 years inclusive | 119 | 132 | 251 | 21+ |
| 10 to 14 years inclusive | 9 | 13 | 22 | 2 |
| 15 to 19 years inclusive | 6 | 4 | 10 | 1 |
| 20 to 24 years inclusive | 2 | 8 | 10 | 1 |
| 25 to 60 years inclusive | 9 | 14 | 23 | 2 |
| Total all ages | 608 | 550 | 1,158 | |

### INFLUENCE OF AGE ON SUSCEPTIBILITY AND THE RESPONSE TO IMMUNIZING INJECTIONS

It is common belief that the mortality from diphtheria is greatest at the ages of from one-half year to 4 years, inclusive; that it then drops steadily until at 10 years it is quite low and so remains during the rest of life. The figures in Table 3 give evidence that this belief is founded on fact.

The greater liability to infection during the first years of life is clearly shown in the results from the Schick test. Our findings in New York City are given in Table 4.

All reports show that under similar conditions the highest percentage of persons having antitoxin occurs among infants passively carrying their mothers' antitoxin, and among adults; between these ages there is first a decrease and then an increase. The same reports show that similar age groups of different children reveal surprising differences in the percentages of those possessing antitoxic immunity.

TABLE 4.—AVERAGE SUSCEPTIBILITY OF VARIOUS AGES TO DIPHTHERIA (AS INDICATED BY THE POSITIVE SCHICK DIPHTHERIA-TOXIN SKIN TEST), IN NEW YORK CITY*

| Age | Schick + (Susceptible) |
|---|---|
| Under 3 months | 15 per cent. |
| 3 to 6 months | 50 per cent. |
| 6 months to 1 year | 60 per cent. |
| 1 to 2 years | 60 per cent. |
| 2 to 3 years | 60 per cent. |
| 3 to 5 years | 40 per cent. |
| 5 to 10 years | 35 per cent. |
| 10 to 20 years | 25 per cent. |
| 20 to 40 years | 18 per cent. |
| Over 40 years | 12 per cent. |

* The percentage of positive reaction is considerably higher among those living in the country.

Table 5 notes the very small percentage of susceptibles in an institution caring for little children gathered from the poorest and most crowded homes of the city. Table 6 exhibits the surprising difference in the results obtained from tests of pupils in different parts of Brooklyn.

A minimum, an average and a maximum result from among the larger Brooklyn public schools subjected to the Schick

test by Dr. Schroder or her assistants is given in Table 6. The ages ranged from 6 to 12 years.

The highest percentage of positive tests obtained by Dr. Schroder in any Brooklyn school was 72, and the lowest 16. These were in small schools. The average percentage of positives among 30,000 children in seventy-three Brooklyn schools was 41.5.

TABLE 5.—RESULTS OF THE SCHICK TEST IN AN INSTITUTION CARING FOR CHILDREN GATHERED FROM DENSELY POPULATED PORTIONS OF NEW YORK CITY

| Age | Schick Reactions: Positive + | Positive ± | Borderland ± | Negative − | Per Cent. Positive |
|---|---|---|---|---|---|
| Under 5 years | 6 | 2 | 0 | 35 | 18.5 |
| 5 to 10 years | 21 | 2 | 8 | 220 | 9.0 |
| 10 to 15 years | 5 | 2 | 4 | 79 | 7.7 |
| | 32 | 6 | 12 | 334 | 9.9 |

The sign ± indicates a trace of antitoxin.

In the Manhattan schools at the same time or a little later, Dr. Zingher among 52,000 children found that the percentage of positives was 30. The highest percentage of positives in any school was 67, and the lowest, 13.6.

The results obtained by Dr. Schroder among adults are very interesting as showing a much older age group. Among 4,396 adult inmates in an insane asylum there were 633 positive reactions, a percentage of 16. At all ages between 20 and 50 years, the percentage was about the same, but above 50 years of age the positives dropped to 10. There were a good many persisting pseudoreactions which made it extremely difficult in some instances to decide between a pseudoreaction and a combined reaction. The patients responded to the toxin-antitoxin injections as well as younger people, except that they showed more local reaction.

TABLE 6.—DIFFERENT PERCENTAGES OF CHILDREN GIVING SCHICK-POSITIVE REACTIONS IN FOUR LARGE PUBLIC SCHOOLS

| No. of Brooklyn School | Total Number of Tests | Per Cent. Positive |
|---|---|---|
| 50 | 1,433 | 19.00 |
| 125 | 1,664 | 36.84 |
| 149 | 1,656 | 41.19 |
| 156 | 1,148 | 61.84 |

IMMUNIZING EFFECT OF TOXIN-ANTITOXIN INJECTIONS IN INFANTS AT BIRTH AND DURING THE FIRST TWO YEARS OF LIFE

If it were possible to immunize young infants, this would be most desirable. In order to test this possibility, 2,000 infants were given full doses by Miss Denny on the third, eighth and eleventh days after birth. Most careful observations revealed absolutely no deleterious effects. At the end of a year, 100 of these infants were retested. Only 52 per cent. gave negative Schick reactions. Since untreated infants of this age give about the same result, it is evident that the combined effect of immature cells and the overneutralization of the toxin-antitoxin present (because of the passive immunity derived from the mother) prevents any appreciable response at birth to the toxin-antitoxin injections. Infants aged 6 months and over gave far better results.

Thus Dr. Blum observed the results of the injections in a number of older infants, in the Home for Hebrew Infants. His figures are given in Tables 7 and 8.

Dr. Byard also reports very favorable results among children in private homes. Many of these were not given the Schick test before receiving the immunizing injections. It is fair to assume that about 50 per cent. would have given negative Schick reactions. Of 286 such children, more than half of whom were under 1 year of age when injected, he noted that 143 (under 2 years of age when injected) when retested after seven months showed 136 negative, five positive and two very doubtful Schick reactions. Of the whole number, seven, or 2.4 per cent., when retested at the end of eight months were definitely positive. Eighteen months after the injections, 1.8 per cent. were positive. These results are certainly very encouraging.

These results of Blum and Byard among infants aged 4 months and over are of extreme practical importance, because from 6 months to 3 years is the period when immunization is most necessary and when it creates the least disturbance.

CONSTITUTIONAL AND LOCAL REACTIONS FOLLOWING THE TOXIN-ANTITOXIN INJECTIONS

Constitutional and local reactions following the toxin-antitoxin injections are negligible in the infant; slight and infrequent in the young child; moderate or rather severe in perhaps 10 per cent. of older children, and slight, moderate or quite severe in a large percentage of adults. The effects are largely due to the protein contents of the culture fluid and are not due to the toxin as such. This is evident because the same reaction follows the injection of the toxic broth rendered atoxic by heating, or of a solution containing a minute quantity of autolyzed diphtheria bacilli. If the toxin were the cause, there would be little or no reaction in naturally immune persons. As is well known, these show

TABLE 7.—RESULTS OF TOXIN-ANTITOXIN INJECTIONS IN SCHICK-POSITIVE CHILDREN

| Number of Infants | Age | Toxin-Antitoxin Injections | Lapsed Period at Time of Retest | Results of Schick Test |
|---|---|---|---|---|
| 6 | 5 mos. | 3 | 3-5 mos. | − |
| 5 | 5 mos. | 3 | 9 mos. | − |
| 3 | 6 mos. | 3 | 4 mos. | − |
| 4 | 7 mos. | 3 | 4-5 mos. | − |
| 12 | 8 mos. | 3 | 4-5 mos. | − |
| Total 30 | | | | |

fully as much reaction as those who have no antitoxin, if not more reaction. Those individuals who give the strong pseudoreactions with the heated or unheated toxin of the Schick test are those who give the most severe reactions with the toxin-antitoxin injections. However, some who give no pseudoreaction with the Schick test give moderately severe reactions to the toxin-antitoxin injections. The horse serum is present in such a minute amount as to cause no appreciable reaction except in a few extremely susceptible individuals. It does not seem to sensitize them appreciably to later doses of horse serum.

In children of school age about 10 per cent. develop fairly sore arms and temperatures of from 99 to 103 F. About 5 per cent. feel miserable enough to stay at home from school

TABLE 8.—RESULTS OF TOXIN-ANTITOXIN INJECTIONS IN SCHICK-NEGATIVE INFANTS

| Number of Infants | Age | Toxin-Antitoxin Injections | Lapsed Period at Time of Retest | Results of Schick Test |
|---|---|---|---|---|
| 1 | 3 mos. | 3 | 4 mos. | ± |
| 2 | 4 mos. | 3 | 4 mos. | − |
| 2 | 5 mos. | 3 | 4 mos. | − |
| 3 | 6 mos. | 3 | 4 mos. | − |
| 6 | 7 mos. | 3 | 4 mos. | − |
| 1 | 8 mos. | 3 | 4 mos. | − |
| 3 | 9 mos. | 3 | 4 mos. | − |
| 3 | 10 mos. | 3 | 4 mos. | − |
| 1 | 11 mos. | 3 | 4 mos. | − |
| Total 30 | | | | |

for one day, and a very few for two days. We have given about 40,000 inoculations this fall and winter without a single infection. Children that are constipated are advised to take a laxative on the day of the injection and to apply a moist dressing to the arm if swelling and soreness develop.

In adults, the reactions are not quite as severe as with the typhoid inoculations. The most severe reactions are restricted almost entirely to those who develop the marked pseudoreaction with the heated or overneutralized toxin. The fol-

lowing history gives an account of one of the most severe reactions that we have encountered:

A nurse at the Willard Parker Hospital was given toxin-antitoxin subcutaneously in the right arm, February 8. In the evening the arm in the region of the injection felt sore and looked red. The next day the soreness and tenderness were more marked. The highest temperature was 103 F. February 9, the patient was in bed. The temperature was 99. The right arm showed moderate redness of the lower two thirds, some induration and tenderness, and slight axillary tenderness. February 10, constitutional symptoms were

TABLE 9.—RESULTS OF INJECTION OF DIFFERENT PREPARATIONS OF TOXIN-ANTITOXIN IN GUINEA-PIGS

| Preparation | Amt. in C.c. | Number Doses | Weeks Elapsed | Percentage of Neg. Schick Reactions | Number Doses | Weeks Elapsed | Percentage of Neg. Schick Reactions | Number Doses | Weeks Elapsed | Percentage of Neg. Schick Reactions |
|---|---|---|---|---|---|---|---|---|---|---|
| 24 | 0.5 | 1 | 7 | 100 | 5 | 5 | 100 | 3 | 7 | 100 |
| 18 | 0.5 | 1 | 12 | 66 | 4 | 5 | 75 | 3 | 9 | 100 |
| 12 | 0.5 | 1 | 8 | 50 | 4 | 8 | 50 | 3 | 7 | 100 |
| 20 | 0.5 | 1 | .. | .. | 4 | 7 | 33 | 3 | 9 | 25 |
| 24A* | 0.5 | 1 | .. | .. | 2 | 7 | 50 | 3 | 7 | 50 |
| 24 | 0.1 | 3 | 7 | 75 | 4 | 7 | 100 | | | |
| 18 | 0.1 | 3 | 10 | 50 | 4 | 9 | 60 | | | |
| 12 | 0.1 | 3 | 8 | 25 | 4 | 8 | 25 | | | |
| 20 | 0.1 | 3 | 7 | 0 | 4 | 8 | 40 | | | |
| 24A* | 0.1 | 3 | 7 | 0 | 4 | 8 | 0 | | | |
| 10 | 0.1 | 3 | 8 | 0 | 4 | 8 | 0 | | | |

* Preparation 24 with an added 10 per cent. of its original amount of antitoxin.

absent. The temperature was normal. Redness and swelling persisted; induration was moderate; tenderness and pain were less marked; axillary tenderness was very slight. A Schick test and control which were made, February 9, both showed a moderate pseudoreaction, the two reactions appearing alike. An area of redness about the size of a 25 cent piece and some induration were present. A small secondary areola around the central area was of marked redness. The probability is great that the test was a pseudoreaction and not a combined reaction.

### THE DEGREE OF IMMUNITY TO DIPHTHERIA INSURED BY A NEGATIVE SCHICK TEST

There is overwhelming indirect evidence which supports the view that under ordinary conditions sufficient antitoxin in the body to prevent the development of a positive Schick test will prevent the development of diphtheria. There can be no doubt that the injection of 500 units of antitoxin will give children an immunity for a period of at least twelve days and usually twenty days. (This is the period during which the Schick test remains negative when performed on such children.) The proof has been derived from its use in many outbreaks and in the exposed children of hundreds of thousands of families.

The recent statements by Havens that about 20 per cent. of diphtheria bacilli are of a different type from the one used to produce toxin for the immunization of horses, that the available monovalent antitoxin will not completely neutralize the toxin made by this other type and, therefore, that diphtheria may develop from infection with this other type in children showing negative Schick reactions to the standard toxin, have not been borne out by experience nor confirmed by us (Park and Williams) in experimental work.

The evidence that antitoxin is the only substance in the body that can prevent the toxin from acting is so conclusive that we can assume that a negative Schick test means the presence of sufficient antitoxin to neutralize it. The debatable points are: Is the minimum amount of antitoxin which is required to give a negative Schick reaction sufficient to prevent absolutely the development of diphtheria? if not, is it sufficient to prevent a toxemia? Closely bound up with the answer to these questions is the degree of certainty that the general practitioner can assume that, as ordinarily carried out, a negative Schick test proves the presence of at least this minimum amount of antitoxin.

It is undoubtedly true that a certain number of persons who have given the negative Schick reaction have developed inflammatory conditions of the throat with positive cultures and that these have been diagnosed as moderate cases of diphtheria. In discussing such cases, it is wise at present to let each person make his own deductions. It is unquestionably true that a certain percentage of Schick tests are made in a faulty way. It is essential to have toxin of approximately the right strength for the test. Toxin of the proper strength when it leaves the laboratory may deteriorate quickly. In testing outfits sent from a number of biologic plants, Zingher found marked irregularity in the contents of some of them. In one case, two out of five outfits failed to give any positive Schick reactions, even though the other outfits gave them regularly in the same children. We ourselves received by mistake a shipment of capillary tubes made of unsuitable glass. The toxin deteriorated rapidly when it was placed in these tubes.

Owing to imperfect technic or weak toxin, a certain number of persons are undoubtedly considered to have antitoxin when none is present. Such individuals are, of course, liable to diphtheria. Besides these, there are those in whom the Schick test is truly negative who have tonsillar exudate and positive cultures. These cases are comparatively few, and so far as I know are never characteristic of well developed diphtheria. It is possible, certainly, for a person to have virulent diphtheria bacilli and develop a throat inflammation from other bacteria. In such a case the positive culture shows the person to be merely a carrier. Even with a positive culture, a case can be considered as undoubted diphtheria only when the lesions are characteristic.

### THE TOXIN-ANTITOXIN MIXTURE

The best mixture is one that is underneutralized and yet perfectly safe. As the mixture stands, the toxin deteriorates faster than the antitoxin, so that it gradually becomes neutralized and later overneutralized by the antitoxin. Therefore, a safe preparation is at its best when freshly prepared. As it would not be practicable to make new mixtures every day, we keep both the toxin and the antitoxin until they have become stabilized. After this has occurred, the toxin-antitoxin mixture changes very slowly. Even so, it is better not to use mixtures later than three months after their preparation unless animal tests prove them to be still slightly underneutralized.

It is noticeable that Preparation 24 gave much better immunizing than any of the others, except Preparation 18, which was a little inferior. The addition of 10 per cent. of the original amount of antitoxin to Preparation 24 lessened

TABLE 10.—IMMUNIZING EFFICIENCY OF DIFFERENT MIXTURES OF TOXIN-ANTITOXIN IN CHILDREN

| School or Institution | Mixture Three Doses 1 C.c. Each | Date Injected | Date Retested | Total Number of Children | Results + | Results — | Percentage of Positive Reactions |
|---|---|---|---|---|---|---|---|
| Colored Orphan Asylum..... | No. 18 | 12/ 5/19 | 3/ 1/20 | 70 | 3 | 67 | 95.7 |
| Hebrew Sheltering and Guardian Home..... | No. 22 | 4/24/20 | 10/23/20 | 54 | 27 | 57 | 70.2 |
| N. Y. Orphanage. | No. 22 | 6/ 5/20 | 10/22/20 | 63 | 25 | 38 | 44.4 |
| P. S. No. 90..... | No. 24 | 12/17/20 | 5/ 3/21 | 160 | 20 | 140 | 87.5 |

greatly its value. The other preparations had stood for some time, become less toxic and lost in immunizing power.

The comparative results of animal and human inoculations with different preparations show that very considerable differences in immunizing value exist. As yet we find it extremely difficult to determine by animal tests the finer differences which decide just when the ideal degree of neutralization is obtained. Dr. Banzhaf now standardizes our preparation so that 1 c.c. causes paralysis in the majority of guinea-pigs weighing 250 gm.; in all, 5 c.c. causes paralysis which ends in death. The results obtained in children and in animals with five different preparations clearly bring out the different degrees of success which are obtained with unequally neutralized preparations (Tables 9 and 10).

### SAFETY OF TOXIN-ANTITOXIN INJECTIONS

In utilizing a substance which is a combination of a poison and an antipoison, it is of extreme importance to be certain that there is no possibility of a properly neutralized mixture becoming at some later period toxic. We have tested out many mixtures and kept them at all possible temperatures, and always found that the mixtures became very slowly more and more overneutralized. The antitoxin portion of the combination is more stable than the toxin. The only objection to using products that have been kept a long time after neutralization is that they are somewhat less effective. The only accident that has occurred in the use of toxin-antitoxin mixtures, so far as is known, was due to an error through which an improperly tested product was sent out. The regulations now adopted by all biologic plants make a repetition of such an accident impossible.

### PRACTICAL APPLICATION IN THE PUBLIC SCHOOLS

The health and school authorities determined to put their chief efforts for the first two years into an attempt to immunize as many schoolchildren as possible rather than to endeavor to protect the children of preschool age who needed the protection so much more. The reasons for this were many and important. It was deemed wise to acquaint as many parents and others as possible with the value of the Schick test and the toxin-antitoxin injections. No better way seemed available than to use the schools as the means of doing this. If each pupil presented his parents with a circular picturing the danger from diphtheria, describing the preventive treatment and asking for permission to administer this treatment if the family physician approved, it would mean that nearly a million adults and a million children would have the arguments for the use of the toxin-antitoxin vaccine presented to them in a favorable way. If, as we hoped, about one half of the children brought back the acceptance of the offer to give them the toxin-antitoxin, we should be able not only to immunize those shown by the Schick test to possess no antitoxin but, by preventing those children from contracting diphtheria, we should also prevent their carrying diphtheria home to the younger children in their families.

The testing of the schoolchildren would also give us the chance to determine exactly what effect the immunization had had. We could make an index of 90,000 children who had been tested and, when Schick positive, had been injected with toxin-antitoxin; a similar index of 90,000 children of the same ages who had refused the test and the injections could be used for comparison. The cases of diphtheria occurring among the children of school age could thus be looked up in either index, and observations made as to how many cases of diphtheria occurred in the two groups. We believed that after one or two years of such observations we should have had evidence of convincing value as to the protection guaranteed by a negative Schick test due either to natural antitoxic immunity or to the response to the toxin-antitoxin injections.

Now, at the end of two years, we actually have such an index completed. The 90,000 tested children and the 90,000 control children have been gathered about equally from the schools of the different boroughs; they were collected by the groups of nurses and teachers from the schools which had been tested by Dr. M. C. Schroder and Dr. Abraham Zingher. Among an equal number of untreated and treated children, there were four times as many cases among the untreated children. The majority of the cases in both groups were of slight or moderate severity. Some of them were possibly cases of nondiphtheritic tonsillitis in children who happened to be carriers of diphtheria bacilli. The methods which we have adopted in the diphtheria prevention work in the schools have already been published by Dr. Zingher (No. 96 of the Reprint Series, Department of Health, City of New York). I will describe them briefly.

A very important point is the enlistment of the interest of the principal of a school. As a rule Dr. I. H. Goldberger, of the bureau of educational hygiene of the department of education, first prepares the way by obtaining permission for us to do the work in the school. According to the borough in which the school is situated, Dr. Zingher, Dr. Schroder or one of their representatives sees the principal and explains fully the objects we have in view. Literature is left for the teachers. Either the principal or the physician meets the teachers in a conference, gives them the necessary information, and tries to arouse their enthusiasm. The success or failure in getting a favorable response from the children or their parents depends largely on the interest which the principal, the assistant principal and the teachers take in the matter. When they give us their enthusiastic cooperation, we expect to obtain consents from three fourths of the parents; when we fail to arouse the teachers' interest, we are fortunate if this is obtained from one fourth of them.

The preparatory work being furnished and the date for the test being determined, we send to the school the circulars and consent slips to be taken by the children to their homes.

Table 11 shows the results among the 180,000 schoolchildren whom we have listed.

TABLE 11.—NUMBER OF CASES OF SUSPECTED DIPHTHERIA DEVELOPING IN 90,000 UNTREATED SCHOOLCHILDREN AND IN 90,000 TESTED BY SCHICK METHOD AND WHEN POSITIVE GIVEN TWO OR THREE INJECTIONS OF TOXIN-ANTITOXIN

| | Cases Reported as Clinical Diphtheria |
|---|---|
| In Brooklyn: | |
| 26,000 originally Schick-negative children (observation from October 1 to February 15) | 2 |
| 15,000 Schick-positive children, 3, 2 or 1 toxin-antitoxin injections | 4* |
| 40,000 control children of same ages | 27 |
| In Manhattan: | |
| 31,000 Schick-negative children (observation from October 1 to February 15) | 3 |
| 19,000 Schick-positive children, 3, 2 or 1 injections | 5 |
| 50,000 control children | 29 |
| Summary: | |
| 57,000 Schick-negative children (observation from October 1 to February 15) | 5 |
| 33,000 Schick-positive children injected with toxin-antitoxin | 9 |
| Among a total of 90,000 Schick-negative or injected children | 14 |
| Among a total of 90,000 control children untreated | 56 |

* Two of these children received but one injection and had no Schick retest. The third showed a Schick + and the fourth a Schick ± reaction on the retest and refused further injections.

As may be seen, there were among the 90,000 untreated schoolchildren four times as many cases of probable diphtheria as developed in the 90,000 tested children.

### SUMMARY AND CONCLUSIONS

The results of twenty-five years of experimental and practical investigation of the immunizing effect of toxin-antitoxin injections and the value of the Schick test are as follows:

Three injections, 1 c.c. each, of a suitable toxin-antitoxin mixture spaced one or two weeks apart, will cause about 85 per cent. of susceptible children or older persons to develop sufficient antitoxin to give the negative Schick reaction and produce marked, if not absolute, protection against diphtheria.

The development of the immunity is slow. An amount of antitoxin sufficient to prevent the positive Schick reaction develops in the different children in from one to six months after the receiving of the injections. Antitoxin as heretofore must continue to be used to produce immediate immunity.

The duration of the immunity in at least 90 per cent. of the children is for more than six years and probably for the remainder of life. There seems to be no difference in this respect between these, and those who develop antitoxin naturally.

Toxin-antitoxin injections should not be given within two weeks after an injection of antitoxin; otherwise the toxin is slightly overneutralized and the resulting development of antitoxin is lessened.

Mixtures made from old toxin and antitoxin are fairly stable and may be used for a period of one year. Even such preparations are at their best when first

sent out, as the mixtures slowly tend to become at first neutralized and then slightly antitoxic. This change gradually lessens the immunizing power of the toxin. The toxin-antitoxin should be kept cool and in a dark place; it is best to use the mixtures within three months after their final preparation.

A toxin-antitoxin mixture of stabilized materials which is safe when it leaves the laboratory cannot become more toxic on being kept. No serious effects have ever resulted from the injections given to the tens of thousands of the New York children since we began our work, seven years ago.

The Schick test is an extremely reliable means of separating those individuals who have antitoxic immunity from those that have none. Although a simple test, it must be carried out with extreme care. The toxin must be retained intracutaneously, and the toxin must be neither 25 per cent. more nor less than the desired amount. It is extremely important to choose glass of suitable chemical composition for the containers in which the toxin is to be placed, as otherwise rapid deterioration may take place.

The preliminary Schick test is usually omitted in children under 3 years of age. This is for two reasons: 1. Two thirds of these children require the toxin-antitoxin injections anyway. 2. We are not certain whether those that do give the negative reaction are immune because of an unusual persistence of the antitoxin given them by their mothers, or because of the active development of antitoxin in their own bodies. After this age the test is desirable, but it is often omitted.

Thus, in practical school work, the first Schick test is frequently omitted in children up to the age of 6 because it is easier to inject the children at once rather than to delay for the test. At this age the percentage of children requiring immunization is still high, and the annoyance from the injections is slight. The omission of the preliminary Schick test facilitates the introduction of the immunizing injections in the schools. Above the age of 6 years, the preliminary Schick test should be made whenever practicable.

No child should be pronounced immune from diphtheria because of having received three immunizing injections of toxin-antitoxin. A negative Schick test is absolutely necessary before one can properly make such a statement or issue a certificate.

The use of the control protein test made with the heated toxin is advisable at all ages when a careful separation of the pseudonegative reaction from the combined positive reaction is important. As with the Schick test, it is frequently omitted because of local conditions. The older the child the more likely it is to be immune and to give a confusing protein reaction. In children under 5 years of age, the protein reaction seldom confuses the picture if the Schick tests are read as late as on the fourth day; between 5 and 7 years, the control does not help greatly in more than 5 per cent. In older children and adults, not only does the control protein test help us to decide more correctly in about 10 per cent. of doubtful reactions; but when it is marked it also indicates with some probability those persons who are likely to have the marked local and constitutional reactions from the toxin-antitoxin injections.

The toxin-antitoxin injections are inadvisable before the age of 6 months. During this time most of the infants retain the antitoxin received from their mothers. Up to the age of 3 months, immunizing injections are usually ineffective, as the infant tissues do not respond sufficiently during this period to the toxin-antitoxin to produce antitoxin. Under usual conditions, it is probably safe to wait until the infant is 9 months old and then to give the injections at the first suitable occasion. During the first three years there is almost no annoyance from the injections. As the child grows older, the danger from diphtheria gradually lessens, and the percentage of those developing annoying local and constitutional reactions slowly increases.

The immunization of schoolchildren in acting to prevent their contracting diphtheria also lessens the exposure to infection of the younger children of preschool age in their families.

There appears to be no difference in the degree of immunity between those individuals who have developed antitoxin from natural causes and those who did so because of the stimulus of the toxin-antitoxin injections.

Institutions in which the children have been given the immunizing injections have been remarkably free from diphtheria.

The schoolchildren who have been injected have had one-fourth as many cases as the untreated children, and these cases have been of less severity.

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## ABSTRACT OF DISCUSSION

Dr. Abraham Zingher, New York: I should like to mention one or two points in connection with the work that we are planning for this summer among children of preschool age. We have practically finished all the public schools in New York City. A great educational campaign has been conducted through these schools in teaching the people the great value of these newer preventive measures against diphtheria. More than 800,000 homes have been reached. We intend to utilize this valuable propaganda. We shall offer the people the opportunity of having their children who are from 6 months to 6 years of age protected against diphtheria. This work will be carried out in the baby health stations, in the day nurseries and in the various mothers and babies' playgrounds in the public schools. We are emphasizing the fact that every child in this age group should be inoculated against diphtheria just as it is vaccinated against smallpox. We shall give these young children the three injections of toxin-antitoxin without a preliminary Schick test; reserving, however, the issuing of a diphtheria protection certificate for the time when the children show a negative Schick reaction. These Schick tests will be made when the children are admitted to school. We feel quite strongly that no child should be pronounced immune to diphtheria until it shows a negative Schick reaction. Another point worth emphasizing is that we found great variations in the immunity response to the same mixture of toxin-antitoxin in retesting several thousand schoolchildren who had been injected with two doses, each 1.5 c.c., of toxin-antitoxin. The number of children who showed a negative Schick retest varied in different schools from 25 to 75 per cent. One of the interesting facts in connection with these results is that the percentage of successfully immunized children in a school was in inverse ratio to the percentage of children who had given a positive Schick reaction at the original test. We noticed no symptoms of anaphylactic shock in giving more than 100,000 injections of toxin-antitoxin. This was also true when repeated series of injections of toxin-antitoxin were given. We shall be glad to send the literature that we use in our work in the schools and in the baby health stations to any physician who is interested in this subject. He should write for it to the Research Laboratory of the New York City Department of Health.

Dr. John F. Hogan, Baltimore: From studies made recently in Baltimore we know that more than 80 per cent. of the deaths in that city from diphtheria were from the laryngeal type. We have no reasons for thinking the rest of the country is different. It is well known by those who have worked in

infectious diseases, especially diphtheria, that a great many of the deaths between the ages of 2 and 5 are from laryngeal diphtheria. Therefore, if we are going to do any good with toxin-antitoxin we must start before the child reaches the age of 2 years. In Baltimore we are going to make a drive for toxin-antitoxin, and we are using the schoolchild as an opening wedge. We are having the schoolchild bring the mother with the baby at the time the second dose is given. In that way we shall reach the young children before they reach the most susceptible age. With the amount of knowledge that we have of the pathologic, etiologic and epidemiologic peculiarities of diphtheria, its death rate should be practically nil and, if we succeed in immunizing practically all children, then this will be accomplished.

DR. WILLIAM H. THALER, St. Louis: The School Hygiene Division in the St. Louis public schools has followed out this work by sending a letter to the home of every schoolchild in the city of St. Louis, recommending the Schick test, and the responses were very gratifying. It may be a mere coincidence, but this year we have had the lowest death rate in diphtheria that I think was ever heard of in St. Louis. We also noted a peculiar situation. There was one child in one block in one of the school districts who received toxin-antitoxin and he was the only child in the block who contracted diphtheria. This incident was reported by the district nurse and later authenticated by investigation.

DR. C. A. EARLE, Des Plaines, Ill.: Diphtheria is the most dangerous infectious disease, and more children die from it than from any other infectious disease. We have reached the end of our rope with antitoxin. Diphtheria may be more prevalent now than it was before the days of antitoxin. There is abundant evidence for believing that these mixtures do the work for which they are designed. To Theobald Smith belongs the greatest credit for the experimental work, and to Dr. Park for the practical application. In a series of more than 400 susceptible children, 85 per cent. were immune six months after the injection of three doses of toxin-antitoxin. When we study Smith's experiments it becomes evident that we cannot expect to immunize all children. He shows that some guinea-pigs may be immunized by even neutral or balanced mixtures of toxin and antitoxin, while others require mixtures of varying degrees of toxicity. It is likely that there is an unknown optimum proportion of the ingredients of the toxin-antitoxin mixture required for each individual. Because of the reliability of the Schick test, no child should be given the toxin-antitoxin mixture whose susceptibility has not been demonstrated by this test. I feel certain that if the whole proposition is explained to the parents, the vast majority would prefer to have the test made first.

DR. W. S. RANKIN, Raleigh, N. C.: Last year in North Carolina the state epidemiologist went into twenty-five counties, called together the practitioners and said, "Gentlemen, your people should be inoculated against typhoid, and your children against diphtheria. I should like to propose a plan by which you can do it and be paid for it." The physicians decided they would do it. They go to the county commissioner and say, "We want to organize with the help of the state board of health a number of public dispensaries to be held for five weeks in this county at ten or fifteen different points." The state board of health sets the time and place for the dispensary, and notifies the public to come in and be inoculated. There is just enough added about the value of inoculation to educate the public. The profession itself divides up the work. Last year we inoculated 70,000 persons against typhoid fever, and 1,000 children between 6 and 12 years of age against diphtheria. The county commissioner paid the local practitioners 25 cents for each complete inoculation and that was $20,000 which went to the profession last year which otherwise would not have been received. The work of the medical profession with the state board of health does not stop when that $20,000 is paid. It goes on. In the dispensaries which were conducted in Union County, N. C., with 35,000 people, the physicians vaccinated 10,000 people in a campaign of five weeks. That was $2,500 paid to twenty physicians—only $125 each, but think of the effect on the business of the profession in keeping up that work. It goes on. The physicians are assuming the leadership in public health work, and they come into complete harmony with the public health officers of the state.

DR. ABRAHAM ZINGHER, New York: Dr. Rankin's remarks are very suggestive. I believe that in the rural sections the only practical way to carry out this work is to immunize with toxin-antitoxin every child of school age as well as of preschool age. The reason is that we have found that more than 85 per cent. of schoolchildren in rural sections give a positive Schick reaction. These children, however, should always be given a final Schick test, after toxin-antitoxin injection, before they are pronounced immune to diphtheria. It is important that every health officer and school physician should be acquainted with the method of diluting bulk toxin. He will then be able to test at a cost of $1 an entire school of 2,000 or 3,000 children. Uniformity of the dilution of toxin he uses and great accuracy in the reactions he obtains will soon give the health officer confidence in the results of the Schick test. This confidence, I am sorry to say, is lacking at the present time wherever physicians use outfits supplied by many of the commercial laboratories.

## THE ETIOLOGY OF EOSINOPHILIC PLEURAL EFFUSION *

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In consideration of the frequency of pleural effusion in general, it is surprising that so few cases of pleural effusion with a large number of eosinophils have been reported in the literature. It is surprising also that the tubercle bacillus as the etiologic agent in these cases has never been isolated from the exudate. Bayne-Jones [1] states that this condition occurs in about 1 to 5 per cent. of all pleural effusions, as determined by investigators applying constant methods to cases in series. Schwartz [2] compiled sixty-eight cases from the literature in his monograph on the subject of eosinophilia. Klein [3] has reported two cases. One was a right-sided pleural effusion following an operation for hemorrhoids, the necropsy revealing septic, thrombosed hemorrhoidal veins, which were believed by the prosector to have been the source of the pleural infection. A second case followed stab wounds in the chest, which resulted in a right-sided hemorrhagic pleural effusion. In the same paper, Klein refers to two cases reported by Harman,[4] in both of which were bloody pleural effusions. One case differed in that the pleural effusion eosinophilia, after rising to 39 per cent. suddenly changed to 95 per cent. mononuclears, which, however, still presented indistinct, though recognizable, eosinophilic granules. No etiologic, parasitic or bacteriologic agency was isolated in any of these cases.

Widal and Ravaut [5] have reported three cases. One had followed typhoid fever. A second occurred in a man, recently returned from the tropics, who presented an enlarged liver and large glands in the axillae and the groin, but in whom no etiologic factor was found. The third case was a hemorrhagic pleural effusion occurring in a case diagnosed by them clinically as tuberculous. This case is identical with one reported by Auché and Carrière,[6] but in neither case were the tubercle bacilli demonstrated. Widal and Ravaut found the fluid in their cases highly toxic to experimental animals, but most observers have not found this. In no animal were

* From the Department of Internal Medicine, University of Michigan Medical School.

1. Bayne-Jones, S.: Bull. Johns Hopkins Hosp. **27**: 299-312, 1916.
2. Schwartz, E.: Ergebn. d. allg. Path. u. path. Anat. **17**: 138-790, 1914.
3. Klein, S.: Centralbl. f. Med. **20**: 97, 1899.
4. Harman, William: Inaug. Diss., Dorpat., 1894.
5. Widal, F., and Ravaut, C.: Compt. rend. Soc. de biol. **61**: 654, 1900.
6. Auché et Carrière: Tr. Congrès de Nancy, 1896, p. 537.

they able to demonstrate any of the organisms of tuberculosis, and the one animal which recovered from a smaller dosage of the fluid failed also to develop any lesion of tuberculosis. Barjon and Cade [7] have reported a case in which animal inoculation was negative. Bayne-Jones has reported a case, occurring during pneumonia, in which the pleural fluid injected into an experimental animal gave negative results.

In Jacob's [8] case the gonococcus was considered to be the causal agent, while in the two cases of Bine,[9] atypical lung infections were present. Bine states that although the Pirquet test was negative in one, the other showed a fairly positive tuberculin reaction to both human and bovine tests. He gives no results from animal inoculations with the pleural fluid, but reports that inoculation with washed sputum into the peritoneal cavity of a white mouse showed only gram-positive lanceolate diplococci. He also calls attention to the apparently small number of cases associated with tuberculosis.

More recently, Grabfield [10] has reported two cases in which no definite etiology was determined. After partially reviewing the literature, he did not deem it justifiable to speculate about the possible etiology of such an exudate, but seemed to believe that this condition should be differentiated from other types of pleural effusions.

Donzello,[11] from six cases observed by him in one year, to which he gave especial study, reached the conclusions that: (1) cytologic examinations have established a special type of pleuritis, eosinophilic pleuritis, which cannot be tuberculous in nature since it is encountered in pleuritic conditions of the most diverse nature, and (2) the fluid is always highly toxic to guinea-pigs. Donzello's statement that the eosinophilia is intermediate between the polymorphonuclear and lymphocytic phases has been confirmed by my case as well as by several others.

Eosinophilic pleural effusions have been reported in association with trauma, tuberculosis, sepsis, typhoid fever, syphilis, pulmonary gangrene, pleuropericarditis, pneumonia, polyarthritis, nephritis, hemorrhagic infarct of lung, endothelioma, septic endocarditis, gonococcal sepsis, myocarditis, cardiac insufficiency, puerperal sepsis, neoplasms and influenza. However, in no case has it been possible to prove that the primary disease was the sole etiologic agent in the atypical type of effusion.

Since no case of eosinophilic pleural effusion from which the tubercle bacillus has been isolated has as yet been reported, and since there seems to be a tendency to consider the condition as being etiologically distinct, I consider it worth while to report a case.

## REPORT OF CASE

*History.*—An unmarried woman, aged 22, entered the hospital, June 1, 1922, complaining of a dry cough, a marked feeling of weakness, and sharp pains in the left side of her chest, which were increased in intensity on breathing. There was no ascertainable history of any familial disease. The patient had had measles, mumps, whooping cough and scarlet fever as a child, with good recovery from all. She had had occasional attacks of tonsillitis up to one year previously, when her tonsils had been removed. The patient had never been associated with any one with open tuberculosis. She was born in Nebraska, and had lived there practically all her life, but for the previous year had been in constant residence in Michigan. Her admission weight, which was her best weight, was 137 pounds (62 kg.). The patient had been feeling well until two months previous to her entrance to the hospital, when she was suddenly seized during the night with a severe frontal headache, dizziness and, she believed, a slight rise in temperature. The following morning she felt much improved, and returned to her usual work, although she still felt slightly ill. Six weeks before admission she had had a second attack, likewise occurring during the night and with the same symptoms as before, but she had the added symptom of very sharp, knifelike pains occurring in the left chest. These sharp pains lasted only a few hours and were followed by a dull pain which persisted in her left chest for several days, and had occurred off and on until the time of admission. The attack which brought her to the hospital started during the night preceding the day of her admission, and appeared to be a recurrence of the sharp pains in the left chest accompanied by a marked feeling of weakness and a dry nonproductive cough and transient periods of dizziness. During the previous two months she had had frequent night sweats, occasional headaches and diminished appetite. There had been no loss of weight, or menstrual or urinary disturbances. She had had a slight afternoon rise of temperature for the previous month, and was unaccountably tired in the afternoon during the same period.

*Physical Examination.*—The patient was slender and well-nourished. She lay comfortably on the examining table, with no marked pain or discomfort. The hair was red and abundant. There was a small, painless enlargement of the anterior cervical lymph glands on both sides. The chest was symmetrical, with a slight limitation of expansion at the left base; it was long and narrow; respirations were slightly increased in rate and decreased in depth. The area of cardiac dulness was shifted to the right. Examination of the lungs revealed marked dulness at the left base, where tactile fremitus was also decreased, and the breath sounds, in whispered and spoken voice, were much diminished, the spoken voice having a slightly tubular quality. There was no retraction of interspaces, and no persistent crackling râles were heard in any area. The remainder of the physical examination was negative.

The hemoglobin was 95 per cent. by the Sahli hemoglobinometer; the red blood cells 3,600,000 and leukocytes 11,000, of which 69 per cent. were polymorphonuclear neutrophils, 18 per cent. large lymphocytes, 8 per cent. small lymphocytes, and 5 per cent. transitionals. No polymorphonuclear eosinophils were found on the initial or following examinations of the blood. The blood pressure was 104 systolic and 54 diastolic. The urine was straw-colored, had a specific gravity of 1.018, and was negative for albumin and sugar. The sediment was also negative.

Examination of the patient's chest on admission and again one week later revealed no pleural line on the right, but on the left there was a rather heavy, dense, mossy pleural line, extending from beneath the second rib down the axillary line to the pleural angle. The right pleural angle was free, but the left was hazy and obscure, and the left base was rather dense to the level of the seventh rib in the axillary line, with a suggestion of a curvilinear line, which was thought to denote fluid. The roentgenogram revealed numerous opacities in the hilum, and slight enlargement of the hilum shadow to the left. There was no change at the right base. Comparison of the earlier and later plates indicated that the left-sided effusion had progressed from the level of the seventh rib to the level of the third rib in one week's time. A third roentgenogram of the chest, taken three weeks after admission and after three thoracenteses had been performed, showed the density at the upper border of the sixth rib.

*Clinical Course.*—During the patient's stay in the hospital she showed a daily afternoon rise of temperature averaging 102 F., with a minimum temperature averaging 100. On the thirteenth day her minimum temperature dropped to normal, and the afternoon rise was averaging 101. She became afebrile on the seventeenth day after admission. Her pulse was very irregular, ranging between 75 and 125, and her

7. Barjon et Cade: Arch. gén de méd. **192**: 1859, 1903.
8. Jacob, F. H.: Brit. M. J. **2**: 203, 1907.
9. Bine, R.: Am. J. M. Sc. **155**: 579-585 (April) 1918.
10. Grabfield, G. P.: Internat. Clin. **4**: 143-149, 1921.
11. Donzello, G.: Policlinico **16**: 462, 1920.

respiration between 20 and 35. A thoracentesis was performed the day following admission, and 10 c.c. of fluid was removed for examination. One week later a second thoracentesis was performed, and 500 c.c. of a slightly greenish tinged effusion was removed. Four days after the second thoracentesis, a third was performed, and 1,000 c.c. of a similar fluid was removed. Shortly after the last operation the patient was suddenly seized with a severe coughing spell and had sharp pains in her lower left chest. During her stay in the hospital her weight fell gradually from 137 to 125 pounds (from 62 to 57 kg.). The patient complained of only slight pain in her chest except after the last thoracentesis. Repeated examinations of her chest revealed that the fluid was being slowly absorbed.

*Pleural Fluid.*—The fluid from the first thoracentesis showed 33 gm. of albumin per liter by the Esbach albuminometer. The leukocytes numbered 550 per cubic millimeter, 70 per cent. of which were polymorphonuclear eosinophils, and 30 per cent. small lymphocytes. The fluid obtained one week later showed 2,200 leukocytes per cubic millimeter and a shift in the differential count to 100 per cent. small lymphocytes. The fluid obtained at the third thoracentesis, taken four days later, showed the same characteristics as the fluid obtained at the second one. A culture was made from the first fluid obtained, and two guinea-pigs received intraperitoneal injections of the fluid. The culture was negative. One animal was also negative. The other animal presented, one month after inoculation, a spleen from which typical acid-fast staining organisms were obtained.

COMMENT

It has been pointed out that the reported cases of eosinophilic pleural effusion have been associated with a great variety of conditions, such as trauma, infection and neoplasm.

The presence of the tubercle bacillus has been demonstrated but once in these seventy-nine or more cases.

Not only did our patient with eosinophilic pleural effusion present the usual clinical signs and symptoms of pulmonary tuberculosis, but, in addition to this, the tubercle bacillus was demonstrated in the fluid obtained from her chest, by means of animal inoculation.

Even though most cases in which this type of pleural effusion is present have not been proved to be tuberculous, nevertheless it does not seem necessary to accept this condition as a distinct etiologic type of pleural exudate, for it is well known that the etiologic factor of most primary pleural effusions is the tubercle bacillus. Latent tuberculous lesions are present in most adults, even the apparently healthy, and the tendency of such lesions to flare up under conditions which lower the resistance has been repeatedly emphasized. Stevens,[12] for example, states that the failure to demonstrate the bacteria in the exudate by microscopic or cultural tests does not exclude tuberculosis, but on the contrary is strong presumptive evidence that a pleurisy has this origin. According to Fishberg,[13] even negative findings after the injection of the fluid, properly controlled, into the peritoneum of a guinea-pig are not conclusive evidence of the nonexistence of tuberculosis. For these reasons it seems probable that a larger percentage of these cases than the literature would lead one to suspect are tuberculous in origin.

12. Stevens, A. A.: The Practice of Medicine, Philadelphia, W. B. Saunders Company, 1922.
13. Fishberg, M.: Pulmonary Tuberculosis, Philadelphia, Lea and Febiger, 1919.

**Dependence of New-Born on Parents.**—If we take a survey of evolution in the animal kingdom, we are impressed with the observation that the higher the stage attained the more dependent are the newborn on their parents.—Heineman: *Milk*, W. B. Saunders Co., 1919.

# THE PATHOGENESIS OF PARATHYROID TETANY *

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The anatomic and functional independence of the thyroid and the parathyroid glands may be regarded as definitely established. It is also certain that the acute nervous manifestations which follow the removal of both organs in carnivorous animals are due to the absence of the parathyroid glands. However, the function of these glands is still an open question, and the pathogenesis of the usually fatal tetany which follows their complete removal is not satisfactorily explained. A number of theories have been advanced from time to time, but since these have been carefully summarized in several recent reviews,[1] reference will be made only to those that have become of interest in my own experiments.

In conformance with the prevailing ideas regarding the possible functions of ductless glands, it is possible that the parathyroids contribute some substance to the blood which is necessary for life, and in the absence of which the animal quickly dies with either symptoms of tetany or severe depression, or that the parathyroid removes some toxic substance from the blood, whose accumulation after parathyroidectomy causes the characteristic symptoms. There is little or no clear-cut evidence that the parathyroids have an internal secreting function, and were it not for the thyroid when the evidence for this kind of function is definite, it is probable that this theory would have received little attention. On the other hand, many, if not all, of the symptoms and other phenomena can be explained on the basis of an intoxication following parathyroid removal. This early theory has received the experimental support of several recent investigators.

Nervous manifestations which in many particulars are identical with those of parathyroid tetany have been observed in animals following various experimental procedures, and in man in a number of pathologic conditions not clearly related to anatomic disturbances of the parathyroid glands. Thus, I have occasionally noted tetany in dogs following the production of an acute obstruction in the duodenum, an occlusion of the pylorus, or the production of closed isolated intestinal loops. The feeding of excessive quantities of meat to dogs having Eck's fistula, or to animals with extensive liver injuries following phosphorus or chloroform poisoning often causes convulsions similar to those seen in parathyroid tetany. Tetany is not infrequently seen in gastro-intestinal disorders of man, particularly accompanying acute dilatation of the stomach and duodenum, dilatation of the colon in children, and various forms of intestinal toxemia. It is a common observation that the feeding of meat to parathyroidectomized dogs accelerates the onset and increases the severity of the tetany, while, conversely, starvation or carbohydrate feeding delays the tetany and fatal issue. Many of these observations are in harmony with the theory of intoxication, which, indeed, is strongly indicated by the dis-

* From the Hull Physiological Laboratories of the University of Chicago.
* Read before the Association for the Study of Internal Secretions, St. Louis, May 22, 1922.
1. Paton, D. N., and Findlay, L.: The Parathyroids: Tetania Parathyreopriva: Its Nature, Cause and Relations to Idiopathic Tetany, Part I, Introduction, General Methods and Symptoms, Quart. J. Exper. Physiol. **10**: 203, 1916. Boothby, W. M.: The Parathyroid Glands, Endocrinology **5**: 403 (July) 1921.

covery of various toxic bases, such as guanidin, methylguanidin, histamin, cholin, trimethylamin, in the urine [2] and in the blood [3] of parathyroidectomized animals.

While it is possible that the toxic substances in parathyroid tetany arise in the body tissues through a defect in protein metabolism, many of the observations point strongly to an exogenous origin, and particularly to the gastro-intestinal tract. In a previous study of the nature of the toxemia in intestinal obstruction, it was found that the responsible toxic materials belong also to this group of bases and are produced in the intestine by the activity of the proteolytic group of intestinal bacteria. These toxic amins are also found in the normal intestinal tract, and their production may be controlled to a large extent by factors which control the intestinal organisms. A diet rich in protein of animal origin leads to the development of a bacterial flora almost exclusively proteolytic in character, and the consequent production of large amounts of toxic amins. On the other hand, a carbohydrate diet, more particularly one containing definite amounts of either lactose or dextrin, produces a change in bacterial types so that the intestinal flora becomes practically entirely fermentative or aciduric. Of perhaps greater importance is the fact, pointed out by Kendall,[5] that the presence of utilizable carbohydrate produces a change in the metabolism of intestinal organisms so that proteins in the medium are spared, and the production of poisons is prevented. The toxemia incident to intestinal obstruction may be delayed according to the degree to which this aciduric type of flora can be maintained in the intestine.

In the following series of experiments, the intestinal flora of dogs was kept aciduric by diets containing adequate amounts of lactose. The stools were liquid and odorless, and smears showed a predominance of gram-positive bacteria.

The first group, consisting of six puppies, about 3 months old, was fed a diet of white bread and milk ad libitum, and lactose, 50 gm. each twenty-four hours. After a preliminary feeding of from four to six days, the thyroid and parathyroid glands were removed. The animals quickly recovered from the operation, and were continued on the special diet. Two died on the fourth day, and the remaining four on the tenth day after the operation. None of them showed any symptoms of tetany or depression, and death occurred suddenly.

The second group, consisting of eleven adult dogs, was fed a diet of boiled rice, beef heart and lactose, from 50 to 100 gm. each twenty-four hours. After a preliminary feeding of five days, the thyroid and parathyroid glands were removed, and the feeding was continued as before. Eight of the dogs showed transient symptoms of tetany on the third to fifth day. Two of the animals died in tetany on the third day, five died of either tetany or depression on the eight or ninth day, and four of the animals recovered from all tetany symptoms and are still alive (from five to seven months).

The third group, of fifteen adult dogs, was fed a diet of white bread, milk and lactose, from 50 to 75 gm. each twenty-four hours, and after a preliminary feeding of from ten to fourteen days the thyroid and parathyroid glands were removed. Ten of the animals showed transient symptoms of tetany on the third or fourth day. One animal died from pneumonia on the tenth day. One died on the sixteenth and one on the seventeenth day in tetany. One died on the thirty-first day from the severe enteritis produced by the diet. Eleven recovered from all tetany symptoms and are still living (from two to six months).

The four animals of the second group and the eleven of the third group that survived the thyroparathyroidectomy are in an excellent state of nutrition and are gaining in weight. There are no symptoms referable to thyroid deficiency. In both groups the special carbohydrate diets were continued for five or six weeks after the operation. Attempts to substitute the usual stock diet or one of meat for the special diet previous to this time resulted in more or less severe tetany. However, after six weeks all of the animals could take the usual laboratory diet of meat and vegetables without the production of any adverse symptoms. The feeding of unusually large amounts of meat, particularly if partly spoiled, or the occurrence of constipation, would often precipitate an attack of tetany in an otherwise normal appearing dog. The mechanism of this readjustment of the body to the loss of the parathyroid glands after five or six weeks' dietary treatment has not yet been definitely determined.

### CONCLUSIONS

1. Parathyroid tetany or depression is due to an intoxication.

2. The responsible toxic substances come chiefly from the gastro-intestinal tract. They arise through the activity of the proteolytic group of intestinal bacteria, and are probably for the most part protein split products of the nature of amins.

3. The function of the parathyroid glands is to prevent intoxication by these poisons.

4. The parathyroid glands do not furnish a hormone necessary for life, and dogs may be kept alive indefinitely after their removal, if treatment directed to the prevention of this toxemia of intestinal origin is carried out.

2. Koch, W. F.: On the Occurrence of Methyl Guanidine in the Urine of Parathyroidectomized Animals, J. Biol. Chem. **12**: 313, 1912; Toxic Bases in the Urine of Parathyroidectomized Dogs, J. Biol. Chem. **15**: 43, 1913.

3. Paton and Findlay (Footnote 1).

4. Dragstedt, L. R.; Moorhead, J. J., and Burcky, F. W.: An Experimental Study of the Intoxication in Closed Intestinal Loops, J. Exper. Med. **25**: 421 (March) 1917. Dragstedt, L. R.; Dragstedt, C. A.; McClintock, J. J., and Chase, C. S.: A Study of the Factors Involved in the Production and Absorption of Toxic Materials from the Intestine, J. Exper. Med. **30**: 109 (Aug.) 1919.

5. Kendall, A. I.: Am. J. M. Sc. **156**: 157 (Aug.) 1918.

## THE EFFECT OF MAGNESIUM SULPHATE ON THE SECRETION OF BILE

### EXPERIMENTAL STUDY *

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During the last few years, much has been written on drainage of the biliary tract by means of lavage of the duodenum with magnesium sulphate solution. It is my purpose to report here the results of experiments undertaken to determine the effect, if any, of magnesium sulphate on the secretion of bile.

### METHOD OF EXPERIMENTATION

Dogs were used in all experiments, and ether anesthesia and rigid sterile technic were employed. Permanent biliary fistulas were made according to the method worked out in this laboratory.[1] In certain experiments the gallbladder was removed; in others it was not.

The fistulas were made in two stage operations. If the gallbladder was to be removed, it was done during the first stage, which consists of transplanting the duodenum just beneath the skin and fascia. About two weeks later, when the wound had healed, the second stage operation was performed. At this time, only the

* From the Division of Experimental Surgery and Pathology, Mayo Clinic.

1. Mann, F. C.: A Technic for Making a Biliary Fistula, J. Lab. & Clin. Med. **7**: 84-86 (Nov.) 1921.

skin was cut through; the common duct was easily located at the point at which it entered the duodenum. The duct was cut in two at its distal extremity, a small rubber catheter was introduced into its lumen, and the end of the duct was fastened in the suture line. Two or three days later, the rubber tube was removed, and a well draining biliary fistula resulted. Ascending infection rarely occurred, and the dogs usually did well and sometimes lived for many months.

After the fistulas were draining properly, the animals were fastened on a frame and made as comfortable as possible. The room was kept quiet during observation, thus reducing to a minimum any psychic stimulation. After a little training the animals lay quietly for many hours at a time. A small catheter or metal cannula was introduced into the fistula, and bile was collected continuously in fifteen minute fractions.

## RESULTS

The normal rate of flow of bile was first determined. Observations were made on animals recently fed and on those from which food had been withheld for

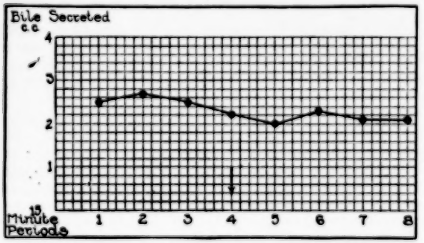


Chart 1.—Normal flow of bile; control experiment. In this and the following charts, arrow indicates injection.

TABLE 1.—NORMAL RATE OF FLOW OF BILE IN DOGS

| Cubic Centimeters of Bile Every Fifteen Minutes | Gallbladder Removed | Gallbladder Not Removed |
|---|---|---|
| First | 1.4 | 3.4 |
| Second | 1.6 | 1.8 |
| Third | 0.8 | 1.0 |
| Fourth | 1.1 | 3.0 |
| Fifth | 1.1 | 2.5 |
| Sixth | 1.2 | 2.6 |
| Seventh | 1.2 | 2.0 |
| Eighth | 1.1 | 1.8 |

twelve hours. No great difference in the rate of flow of bile was noted; however, the rate was somewhat more uniform under fasting.

In one series of experiments, magnesium sulphate was injected into the lumen of the duodenum by means of a hypodermic syringe. This was very easy and caused the animal little or no inconvenience, as the duodenum had been transplanted just beneath the skin and was well fixed in its new position. The method offers an excellent means of studying the pharmacologic action of other drugs introduced under physiologic conditions without first being passed through the stomach.

In another series of animals the magnesium sulphate was introduced intravenously. The salt was dissolved in distilled water, boiled, and left to cool to body temperature. Injections were made into superficial veins of the leg.

Only those experiments in which the animals were quiet and the experimental conditions ideal were considered. The effect of the intraduodenal and intravenous injections on the flow of the bile was carefully noted. Each experiment was controlled by determination of the normal flow of bile in cholecystectomized and noncholecystectomized animals, and by determination of the normal flow of bile for each animal (Table 1 and Chart 1).

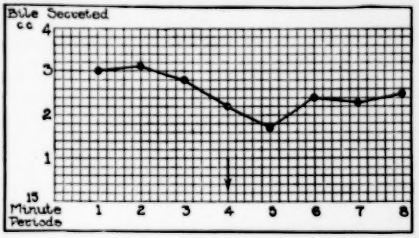


Chart 2.—Flow of bile before and after intraduodenal administration of magnesium sulphate.

TABLE 2.—EFFECT ON THE FLOW OF BILE OF MAGNESIUM SULPHATE INJECTED INTO THE DUODENUM IN DOGS

| Cubic Centimeters of Bile Every Fifteen Minutes | Gallbladder Removed | Gallbladder Not Removed |
|---|---|---|
| First | 4.8 | 2.6 |
| Second | 4.2 | 1.2 |
| Third | 3.5 | 1.4 |
| Fourth | 2.7 | 1.7 |
| **Cubic centimeters of bile secreted following injection at fifteen minute intervals** | **5 gm. of magnesium sulphate in 20 c.c. of water injected into duodenum** | **10 gm. of magnesium sulphate in 30 c.c. of water injected into duodenum** |
| First | 2.0 | 0.8 |
| Second | 2.5 | 1.4 |
| Third | 2.6 | 0.1 |
| Fourth | 2.8 | 0.8 |

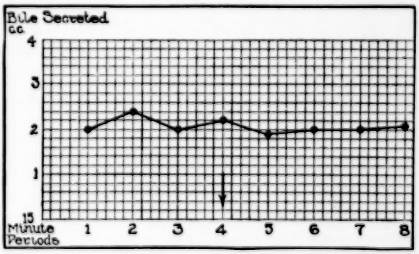


Chart 3.—Flow of bile before and after intravenous injection of magnesium sulphate.

TABLE 3.—EFFECT ON THE FLOW OF BILE OF MAGNESIUM SULPHATE INJECTED INTRAVENOUSLY IN DOGS

| Cubic Centimeters of Bile Every Fifteen Minutes | Gallbladder Removed | Gallbladder Not Removed |
|---|---|---|
| First | 1.9 | 2.0 |
| Second | 2.0 | 2.2 |
| Third | 2.0 | 1.2 |
| Fourth | 2.1 | 1.6 |
| **Cubic centimeters of bile secreted following injection at fifteen minute intervals** | **1.2 gm. of magnesium sulphate in 10 c.c. of water intravenously** | **2 gm. of magnesium sulphate in 15 c.c. of water intravenously** |
| First | 1.9 | 1.2 |
| Second | 2.0 | 1.2 |
| Third | 2.0 | 1.2 |
| Fourth | 2.1 | 1.4 |

Bile was collected in fifteen minute fractions for one hour in order to determine the normal flow. The solution of magnesium sulphate was then injected into the duodenum, and observations on the flow of the bile were made for one hour in fifteen minute fractions (Table 2 and Chart 2). Similar observations were made before and after intravenous injection of magnesium sulphate (Table 3 and Chart 3).

In order to test the validity of the procedure of the intraduodenal injection of magnesium sulphate, experiments were carried out in which fresh bile was injected into the duodenum in the same manner (Table 4 and Chart 4). The experiment was controlled by another in which physiologic sodium chlorid solution was used instead of bile.

### COMMENT

The experiments outlined were undertaken in order to determine whether magnesium sulphate introduced directly into the duodenum or into the circulation would cause any change in the volume or in the character of the bile. The data tabulated are representative of observations on many dogs.

The technic employed was simple and easily executed. When the common duct was cut at its entrance into the duodenum, any nerve path which might have passed by this route was also severed. If a nerve reflex was dependent on such a route it would have been abolished.

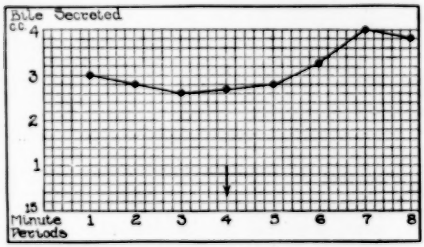


Chart 4.—Flow of bile before and after bile had been injected into the duodenum.

TABLE 4.—EFFECT OF INTRADUODENAL INJECTION OF BILE IN DOGS

| Cubic Centimeters of Bile Every Fifteen Minutes | Gallbladder Not Removed | |
|---|---|---|
| First | 2.1 | 3.0 |
| Second | 2.0 | 2.8 |
| Third | 1.6 | 2.5 |
| Fourth | 1.7 | 2.7 |
| **Cubic centimeters of bile secreted following injection at fifteen minute intervals** | **15 c.c. of physiologic sodium chlorid solution injected intraduodenally** | **15 c.c. of fresh bile injected intraduodenally** |
| First | 1.2 | 2.0 |
| Second | 1.0 | 3.5 |
| Third | 1.5 | 4.0 |
| Fourth | 1.7 | 3.8 |

It was found that the rate of flow of bile in the control experiments was more uniform when the animals were fasting; therefore, any fluctuation in the rate of flow after the injection of magnesium sulphate could best be determined in the fasting state.

After intraduodenal injection of magnesium sulphate, the duodenum, which was clearly visible through the skin, at first contracted and then remained markedly relaxed for from thirty minutes to one hour. This initial contraction was probably due to mechanical stimulation by introduction of the needle and the solution.

### CONCLUSIONS

The results of our experiments were entirely negative. When magnesium sulphate solution was injected directly into the duodenum of dogs or injected into the circulation, there was neither acceleration of the rate of flow of bile, nor change in the color. In many instances the rate was even somewhat retarded.

When bile was injected into the duodenum, there was a definite, prompt increase in the flow of bile.

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## BILATERAL ABDUCTOR PARALYSIS OF THE LARYNX CAUSED BY "MOONSHINE" WHISKY

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Alcoholism seems to be one of the rarest of etiologic factors in paralysis of the bilateral abductors (the crico-arytenoidei postici) of the larynx, an extremely serious and often fatal condition. A thorough search of the literature, including a study of Semon's [1] masterful treatise on motor disturbances of the larynx, disclosed but one fully reported case of this kind. In fact, alcohol is not even mentioned by Semon nor is reference made to it in any of the hundreds of reports he had accumulated. Only in Oppenheim's textbook is it mentioned among the possible etiologic factors of multiple neuritis affecting the vagi, among other nerves.

The only recorded case is that reported by Uffenorde.

### REPORT OF UFFENORDE'S CASE

A man, aged 59, as a result of heavy drinking, developed first a partial brachial paralysis and then symptoms of laryngeal obstruction, dyspnea, cough and cyanosis. The vocal cords were completely adducted and failed to move from the median position on inspiration. With the exception of some pachydermic masses on the cords, there was no other local pathologic condition, neither were there symptoms of any other nerves being involved. Three days after he had been denied the use of alcohol, the stridor and dyspnea disappeared and both cords began to abduct slightly on inspiration, and, within six days, function was completely restored.

The patient, however, resumed drinking and returned to the hospital a year later with a recurrence of the dyspnea and other symptoms. The vocal cords were again absolutely immobile in the midline. The dyspnea and cyanosis were so marked that a tracheotomy was performed. Again recovery took place within a very few days, and the patient was dismissed. He returned several times later on account of dyspneic attacks which followed heavy drinking; but at no time was the paralysis evident, as in the original attacks. It was rather a spastic closure of the glottis, of short duration, in which the psychic impress of the previous experiences was the dominant factor. The later attacks rapidly disappeared under palliative treatment.

### REPORT OF AUTHORS' CASE

In the case which we had the opportunity to observe, the attack presented a group of symptoms suggestive of the Avellis-Schmidt syndrome, which is generally due to bulbar lesions or tumors in the region of the jugular

1. Semon, in Handbuch der Laryngologie und Rhinologie, Vienna, Paul Heymann, **1**, 1889.
2. Oppenheim: Lehrbuch der Neurologie, 1907.
3. Uffenord.: Ztschr. f. Ohrenh. **72**: 83, 1915.

fossa. The lesions involved the facial, vagus and hypoglossal nerves, on one side, together with some of the upper cervical motor nerves and some fibers of the opposite vagus. The spinal accessory nerve apparently escaped.

The provocative agent was a home-distilled "moonshine." Since the advent of prohibition and the consequent increase in the consumption and manufacture of improperly distilled liquors and synthetic concoctions, a new form of alcoholism has come to light, differing considerably from the classic type of days past. Its predilection for the ocular apparatus and its tendency toward strange psychoses are among the more recently observed manifestations. Our case demonstrated the extremely toxic effects of these beverages on nerve cells, as manifested by the multiple neuritis as well as the mental derangement.

*History.*—C. W., man, aged 43, a woodworker, was brought in suffering with difficult respiration of about eight hours' duration. He stated that the attack began the night before, with a choking sensation, and that he had never suffered an attack of this kind before; nor could he state what brought in on. The dyspnea was chiefly inspiratory.

*Examination.*—The preliminary examination revealed an emphysema and piping râles throughout the chest. A provisional diagnosis of asthma was made. A little later a laryngeal examination was made. It was found that the vocal cords were in complete adduction, and, except for a slight wavering of the right cord, failed to abduct on inspiration. There was a slight amount of edema of the arytenoids and the aryepiglottic folds.

The cyanosis and stridor, though marked, were not sufficient to necessitate immediate tracheotomy. The following day, the dyspnea was still pronounced, and the patient complained of headache, cough, and nausea, which were later followed by vomiting. These symptoms persisted, and, in addition, the patient became irrational and boisterous, and tried to get through a locked door leading to the fire escape. Restraints were applied. He continued to be very restless and noisy, talking loudly and irrationally. The pulse was weak and thready, ranging from 130 to 156, and the respirations were correspondingly rapid (48 to 54). His expression was anxious, and he perspired freely. Cyanosis, though present, was not threatening. In addition, the examination disclosed: (1) paresis of the right side of the face; (2) paresis of the right half of the tongue; (3) inability to elevate the chest (paresis of the accessory muscles of respiration; the pectoralis minor, serrati and scaleni); (4) increased knee jerks; (5) doubtful Babinski on the left side; (6) normal pupils and fundi.

The multiplicity of symptoms suggested cerebrospinal syphilis, which diagnosis, however, was later ruled out through the subsequent course of the case and the negative Wassermann reactions on both blood and spinal fluid.

The leukocytes numbered 9,800; the urine was negative for albumin, sugar and casts. The following day the patient was improved. Breathing was easier; he was more rational, quieter and the pulse was slower (pulse, 118; respiration, 24). Examination of the larynx revealed the left cord immobile in adduction; the right cord abducting slightly on inspiration; the epiglottis and arytenoids somewhat edematous.

At this time, by close questioning, we obtained the information that the patient had for some time past been imbibing freely of a home-made alcoholic distillate which was being manufactured in the neighborhood, and that just previous to the onset of the attack he had obtained several bottles that had recently been made. Nothing definite could be ascertained as to the exact nature of the concoction, except that it was almost white and was "very strong."

A roentgenogram of the chest at this time proved negative.

*Course.*—The paresis of the face, tongue and chest muscles disappeared within forty-eight hours, and the laryngeal condition showed progressive improvement. Examination on the nineteenth day, under direct laryngoscopy (local anesthesia), revealed the right cord moving freely, both in abduction and adduction; the left cord was still in adduction and moved but slightly on deep inspiration. There were slight pachydermic masses on both cords and the interarytenoid space, but no edema, tumor or ulcer.

The patient returned to the hospital for observation at weekly intervals for two months and showed a general improvement, gaining 20 pounds (9 kg.) in weight.

Examination, three months after the attack, demonstrated the right cord completely recovered and the left one almost in the cadaver position, although showing some slight motion on phonation. It appears that the paralysis of the recurrent nerve was almost complete on this side, having gone through the cycle in accordance with Semon's law, beginning with the abductors and ending with the adductors.

The voice is, nevertheless, very good, as the right vocal cord during phonation overrides the median line and opposes the left cord in the oblique position.

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# RELATIVE VALUE OF SACHS-GEORGI AND WASSERMANN REACTIONS IN DIAGNOSIS OF SYPHILIS

## AN ANALYSIS OF ONE THOUSAND SEVEN HUNDRED AND FORTY-EIGHT PARALLEL TESTS *

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An enormous literature has accumulated regarding the relative merits of the Sachs-Georgi and the Wassermann tests in the diagnosis of syphilis, a literature that is so filled with contradictions that an unprejudiced reader is utterly at a loss in evaluating the relative accuracy of the two tests. Some observers claim for the Sachs-Georgi reaction a greater specific value in the diagnosis of the disease than is possessed by the Wassermann reaction, while others conclude that the Sachs-Georgi test is less accurate or absolutely unreliable.

In view of the discordant results recorded in the literature with the Sachs-Georgi test, we believed that it would be of some value to compare the results obtained with the two tests on routine specimens of blood sent to the laboratories of the Army Medical School for the Wassermann test. This work has covered a period of nearly one year and has been very carefully conducted, the Wassermann tests being made and read by one of us (W. C. W.), while the Sachs-Georgi tests were made and read by the other (C. F. C.). In this way all leaning toward forcing an agreement between the results of the tests, which might unconsciously be brought about when a single person makes and reads both tests, was avoided and an absolutely unprejudiced reading of both was possible, as neither of us knew at the time of reading his tests what result had been obtained with the comparative test.

From our experience we are positive that a greater agreement between the two tests would have been obtained had one observer made all of the readings for both, but we are also positive that the data so obtained would have been very unreliable, as many of the weak Sachs-Georgi reactions would have been read

* From the Division of Laboratories, Army Medical School.

as positive in order that the result might agree with the result of the Wassermann test, despite the fact that just as strong Sachs-Georgi reactions were frequently noted in nonsyphilitic cases. The very high percentage of agreements between the results of the Sachs-Georgi and the Wassermann tests recorded in the literature by some observers were perhaps due to the fact that readings of the two tests were made by a single observer who had a knowledge of the results of both and who, in comparing the results, unconsciously strove for an agreement in the doubtful cases. At any rate, we feel sure that in comparative research of this character it is most important that the results of the tests under comparison be read by independent observers, as otherwise it is practically impossible to avoid errors due to a desire to force agreements where none really exist. For this reason we believe that our results are more truly representative of the real relative value of the two tests than many that have been published in the literature.

## TECHNIC

The technic employed in making the Sachs-Georgi tests was that recommended by Sachs and Georgi,[1] with slight variations in the mixing of the antigen and salt solution, which will be referred to later. The antigen employed consisted of a 20 per cent. alcoholic extract of beef heart muscle fortified by the addition of cholesterin. The amount of cholesterin to be added in order to secure the best results was determined by carefully weighing out different amounts and adding them to 10 c.c. of the extract in such a manner as to make the different portions of the antigenic extract contain 0.2, 0.3, 0.4, 0.5 and 0.6 per cent. of cholesterin. These portions of cholesterinized extract were then titrated with known positive and negative serums and the portion of extract giving the best results was selected for use in the test. The percentage of cholesterin to be added to the alcoholic extract of beef heart was found to vary slightly with different extracts, but was generally either 0.4 or 0.5 per cent.

The cholesterinized extract before use in the test was diluted with 5 parts of physiologic sodium chlorid solution. The method by which this dilution is made is of immense importance as regards the results of the test, as will be shown later.

The serums to be tested were inactivated at 55 C. for one-half hour in the water bath and diluted with 9 parts of physiologic sodium chlorid solution, after which 5 parts of the diluted antigen were added and the whole mixture incubated at 37 C. for from eighteen to twenty-four hours. In our tests each test tube contained 0.9 c.c. of physiologic sodium chlorid solution, 0.1 c.c. of the serum to be tested and 0.5 c.c. of the antigenic suspension.

The technic used in the Wassermann tests was the modification devised by one of us (C. F. C.), which is used in the routine work of this character at the Army Medical School. In this modification a human hemolytic system and a cholesterinized antigen are employed. The exact technic has been described in detail elsewhere.[2]

*Terms Employed in Reading the Tests.*—In reading and recording the results of both the Sachs-Georgi and the Wassermann tests the following terms were employed: Double plus (++), plus (+), plus-minus (+—), and negative (—). The term double plus indicates complete flocculation with the Sachs-Georgi test and complete inhibition of hemolysis with the Wassermann test. The term plus indicates marked flocculation with the Sachs-Georgi test and anything between complete inhibition of hemolysis and 50 per cent. of hemolysis with the Wassermann test. The term plus-minus indicates very slight flocculation with the Sachs-Georgi test and anything between 50 per cent. of hemolysis and complete hemolysis; while the term negative indicates no flocculation with the Sachs-Georgi test and complete hemolysis with the Wassermann test.

The Sachs-Georgi test owes its origin to the observation that when a suitable amount of a cholesterinized alcoholic extract of a human or beef heart is added to the diluted blood serum of a patient suffering with syphilis, a characteristic flocculation occurs in the mixture, either immediately or after incubation, and the value of the test depends entirely on the degree of flocculation noted in the serum tested. In our work the utmost care was exercised to determine the presence or absence of this phenomenon in the serums tested and it early became evident that if we depended on reading the tests with the naked eye we would miss many positive reactions. For this reason we have read the end reactions of the Sachs-Georgi test with a low power hand lens against a dark background. We found that considerable practice was necessary before some of the positive reactions with this test could be differentiated from the appearance caused in some serums by the formation of certain precipitates and that even with the greatest care it was sometimes impossible to be sure of the presence or absence of flocculation. From our experience in this respect, we believe that the use of this test should be restricted to those well trained in its technic and interpretation, for otherwise serious errors in its diagnostic use will certainly occur very frequently.

The difficulty of reading the partial reactions and of interpreting their meaning is great with the Sachs-Georgi test, and we soon found that any reaction with this test below a plus reaction was absolutely valueless in diagnosis. Thus all plus-minus reactions were worthless, as a slight amount of flocculation occurred just as frequently in nonsyphilitic serums as in those known to have been taken from syphilitic patients. In this report, it should be understood that when the Sachs-Georgi reaction is called positive, it means that at least a plus reaction was obtained in the serum examined. All plus and double plus reactions with the Sachs-Georgi test were considered as positive reactions in our work, and all plus-minus and negative reactions were considered negative. With the Wassermann test, only double plus reactions were considered as positive reactions, but the plus reactions with this test were included with the positive reactions in estimating the total agreements with the two tests.

In all, 1,748 serums were tested with both tests, and at the same time. The tests may be divided into two groups, as regards the results obtained: Group 1, in which the antigenic suspension was used within from ten to fifteen minutes after adding the saline solution to the antigenic extract, and Group 2, in which the salt solution was added to the antigenic extract and the mixture allowed to stand for two hours before use. As will be noted from a study of the results obtained, very much better results were secured when the anti-

1. Sachs, H., and Georgi, W.: Med. Klin. 14: 805, 1918.
2. Craig, C. F.: The Wassermann Test, Ed. 2, St. Louis, 1921, pp. 99-116.

gen was diluted and allowed to stand for two hours before use. In Group 1, 748 serums were tested with both tests, while in Group 2, 1,000 serums were tested.

The fact that allowing the antigenic mixture to stand for two hours after adding the salt solution greatly increases the diagnostic value of the Sachs-Georgi test is well shown in our results and illustrates only one of the many factors that either increase or decrease its delicacy and thus render this test one that is unstable and liable to great variations in results in different laboratories. Thus the mere method of adding the salt solution to the antigenic extract is most important, for, if it is added rapidly, less accurate results and a smaller number of positive reactions are obtained than when it is added slowly, even drop by drop. The exact mechanism of this reaction is yet unknown, but it undoubtedly depends in large measure on the surface tension of the mixtures and this is markedly influenced by causes that are often beyond the control of the investigator.

We believe that the results that we obtained in the serums included in Group 2, taking into consideration the fact that the readings were absolutely uninfluenced by a foreknowledge of the results obtained with the comparative test, represent what may be expected of the Sachs-Georgi test when it is carefully made under the best possible conditions, and that the results in Group 1 represent what may be expected of it when some little understood factor, as the time that the antigenic extract and the salt solution should remain in contact, is active. In this way, the greatly divergent results of this test as reported in the literature may be partially explained.

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### RESULTS OF PARALLEL TESTS IN GROUP 1

In Group 1 are included the serums tested with the Sachs-Georgi test in which the antigen was diluted with 5 parts of physiologic sodium chlorid solution (0.85 per cent.) and the mixture used within fifteen minutes after the salt solution had been added. In this group, 748 serums were tested with both the Sachs-Georgi and the Wassermann tests with the following results: total number of parallel tests made, 748; total number of positive (++) Wassermann reactions, eighty-eight, or 11.7 per cent.; and total number of positive Sachs-Georgi reactions, fifty-three, or 7.0 per cent.

In addition to the positive or double-plus Wassermann reactions mentioned, there were sixty-two plus Wassermann reactions, or 8.2 per cent. of the total number of serums tested, which should, without doubt, be included in the positive Wassermann tests, as they were obtained in very early or treated syphilitic infections. If these are added to the double-plus Wassermann reactions, we have a total of 150 positive Wassermann tests, or nearly 20 per cent. of the total number of serums tested, as compared with only 52 positive Sachs-Georgi reactions, or 7 per cent. of the total number of serums tested.

However, the chief interest in these parallel tests with the two reactions is concerned with the number of agreements in results. Taking into consideration only the double plus Wassermann reactions and the double plus and plus Sachs-Georgi reactions, there was an agreement in results in 596 serums, or 79.6 per cent. of the total serums tested. If to these figures are added those serums in which a single plus Wassermann reaction was obtained and a positive Sachs-Georgi test, the number of agreements are increased to 602, or 80.4 per cent of the total serums tested.

This is a fair average percentage of total agreements between the two tests as shown in the literature; but, when one examines the total number of agreements in the positive and negative reactions, our results are very disappointing as regards the value of the Sachs-Georgi test in the diagnosis of syphilis. Thus, in only twenty-five of the eighty-eight double plus Wassermann serums did the Sachs-Georgi test give a positive reaction or a total agreement of only 28.4 per cent. In other words, sixty-three serums, or 71.5 per cent. of the double plus Wassermann cases, were absolutely missed by the Sachs-Georgi test.

On the other hand, there were twenty-two serums in which the Sachs-Georgi test gave a positive result and in which the Wassermann test was doubtful or negative. These serums constituted 41.4 per cent. of the total positive Sachs-Georgi reactions so that it may be stated that 41.4 per cent. of the total positive Sachs-Georgi reactions were not confirmed by the Wassermann test. If this fact indicated that this number of syphilitic cases were missed by the Wassermann test, it would speak very favorably for the superior delicacy of the Sachs-Georgi reaction; but, as will be later observed, such an interpretation cannot justly be placed on these disagreements in results.

As regards the negative reactions obtained with both tests, there was a very close agreement, no less than 571 of the serums giving a negative reaction with both tests. Thus, of the 593 serums that gave a negative reaction with the Wassermann test no less than 571 also gave a negative reaction with the Sachs-Georgi test or an agreement percentage of 96.3.

From the results given it is evident that in this group of parallel tests, the Sachs-Georgi reaction proved to be of very much less value in the diagnosis of syphilis than the Wassermann reaction and that it was untrustworthy in that no less than 41.4 per cent. of the comparatively few positive reactions obtained with it were not confirmed by the Wassermann reaction, or, as will be shown later, by the clinical symptoms or history of the patients from whom the blood serum was obtained.

### RESULTS OF THE PARALLEL TESTS IN GROUP 2

While the work on the tests in Group 1 was being conducted, it was noted that an antigenic extract to which the physiologic sodium chlorid solution had been added two hours before use gave a much higher percentage of positive results with the Sachs-Georgi test than the same antigenic extract to which the saline solution had been added from ten to fifteen minutes before use. This phenomenon was investigated by adding the saline solution to the antigenic extract and waiting for varying periods of time before using the mixture in the test, and it was found that the maximum of positive results was obtained when an interval of two hours was allowed to elapse after the addition of the salt solution before using the mixture as an antigen.

All of the serums included in Group 2 were tested simultaneously by both the Sachs-Georgi and the Wassermann tests. The antigen in the Sachs-Georgi test was mixed in the manner above described, and, if the results obtained with this test are compared with those obtained in Group 1, it is at once obvious that they are better than those obtained with the freshly mixed antigen.

In Group 2, 1,000 serums were tested, with the following results: total number of parallel tests made, 1,000; total number of positive (++) Wassermann

reactions, 156, or 15.6 per cent.; and total number of positive Sachs-Georgi reactions, 181, or 18.1 per cent.

In addition to the positive, or double plus, Wassermann reactions, there were fifty-three plus Wassermann reactions, or 5.3 per cent. of the total number of serums tested which should be included in the positive Wassermann reactions, as most of them were in known treated syphilitic infections. If these are added to the double plus Wassermann reactions, the total positive Wassermann reactions equal 209, or 20.9 per cent., as compared with 181 positive Sachs-Georgi reactions, or 18.1 per cent. of the total serums tested.

As regards the number of agreements between the tests in this group of cases, taking into consideration only the double plus Wassermann reactions and the plus and double plus Sachs-Georgi reactions, there was an agreement in results in 832 cases, or 83.2 per cent. of the total serums tested, while if to these figures are added the plus Wassermann reactions in which the Sachs-Georgi test was positive, twenty-six in number, the two tests agreed in their results in 858 cases, or 85.8 per cent.

TABLE 1.—COMPARATIVE RESULTS OF THE SACHS-GEORGI AND THE WASSERMANN TESTS IN 1,748 CASES

| | Group 1 | | Group 2 | |
|---|---|---|---|---|
| | Number | Per Cent. | Number | Per Cent. |
| Total number of parallel tests made | 748 | | 1,000 | |
| Total number of positive (++) Wassermann reactions | 88 | 11.7 | 156 | 15.6 |
| Total number of plus (+) Wassermann reactions | 62 | 8.2 | 53 | 5.3 |
| Number of doubtful (±) and negative (—) Wassermann reactions | 598 | 79.2 | 777 | 77.7 |
| Number of positive Sachs-Georgi reactions | 53 | 7.2 | 181 | 18.1 |
| Number of negative Sachs-Georgi reactions | 695 | 92.8 | 819 | 81.9 |
| **Agreements** | | | | |
| Agreements in positive reactions | 25 | 23.4 | 104 | 66.6 |
| Agreements in negative reactions | 571 | 96.3 | 728 | 93.7 |
| Total absolute agreements | 596 | 79.6 | 824 | 82.4 |
| Additional probable agreements | 6 | 0.6 | 36 | 4.0 |
| Total agreements | 602 | 80.4 | 860 | 86.0 |
| **Disagreements** | | | | |
| In this portion of the table the percentage given shows the positive (++) Wassermann reactions missed by the Sachs-Georgi test | | | | |
| Wassermann positive (++); Sachs-Georgi negative or doubtful | 63 | 71.5 | 82 | 33.0 |
| Wassermann negative or doubtful; Sachs-Georgi positive | 22 | 41.4 | 48 | 26.5 |

This percentage of total agreements between the two tests is about that reported by most observers; but here, as in Group 1, a careful examination of the number of agreements between the positive and negative reactions with the two tests proves very disappointing so far as the practical value of the Sachs-Georgi test in the diagnosis of syphilis is concerned. Thus, in only 104 of the double plus Wassermann reactions, 156 in number, did the Sachs-Georgi test give a positive reaction, more than 33 per cent. of the cases giving a positive Wassermann reaction being missed by the Sachs-Georgi test. There were forty-eight serums in which the Wassermann test was negative or doubtful and which gave a positive reaction with the Sachs-Georgi test. These serums comprised 26.5 per cent. of the total number of serums giving a positive Sachs-Georgi reaction, so that it may be stated that 26.5 per cent. of the positive Sachs-Georgi tests could not be confirmed by the Wassermann test, and an inquiry into the history of the patients from whom these serums were obtained demonstrated that neither the history nor the symptoms present at the time of the blood examination indicated syphilitic infection.

In this group of serums, the number of agreements between the negative tests was high, no less than 728 of the total 777 serums giving a negative result with the Wassermann test, or a total negative agreement of 93.7 per cent.

The accompanying table gives the results that we obtained with the Wassermann and Sachs-Georgi tests in both Group 1 and Group 2 and well illustrates the marked differences in the results with the Sachs-Georgi test, produced by the delay of two hours in using the antigenic mixture after the salt solution was added.

### ANALYSIS OF DISAGREEMENTS BETWEEN THE TWO TESTS

In view of the importance of ascertaining the real, practical relative value of the Sachs-Georgi and the Wassermann tests in the diagnosis of syphilis, a careful study was made of the cases in which the two tests gave divergent results. These cases may be divided into those giving a double plus or positive Wassermann reaction and a negative Sachs-Georgi reaction and those giving a positive Sachs-Georgi reaction and a negative Wassermann reaction. Only the disagreements observed in Group 2 were considered, as it was in this group that the best results were obtained with the Sachs-Georgi test and it was our desire to give the latter test the fairest trial possible before reaching a conclusion as to its value in diagnosis, as compared with the Wassermann test.

*Cases with a Double Plus Wassermann Reaction and a Negative Sachs-Georgi Reaction.*—There were fifty-two specimens of blood serum from as many patients that gave a positive Wassermann reaction and a negative Sachs-Georgi reaction. A very careful inquiry was made into the antecedents, history and symptoms of these patients, with the following results:

Of the fifty-two cases, forty-five, or 86.9 per cent., were either known or probable cases of syphilis presenting suspicious histories or symptoms of the disease. In four cases, or 7.6 per cent., no history of syphilis could be obtained, and, save for an optic atrophy in one case, these patients presented no evidences of syphilis. However, in three of these cases, the positive Wassermann reaction was again obtained at a later date, and it is probable that these patients were really suffering from a latent syphilitic infection. These cases are not included in the forty-five known infections just mentioned. In three cases, no information could be obtained.

The investigation of the cases in which the Wassermann test was positive and the Sachs-Georgi negative demonstrated that forty-five of a total of 156 patients with a positive Wassermann reaction and known to be syphilitic gave a negative reaction with the Sachs-Georgi test. In other words, 28.8 per cent. of the known syphilitic patients would have remained undiagnosed, so far as a test of their blood serum is concerned, had we depended on the Sachs-Georgi reaction in diagnosis.

*Cases with a Negative Wassermann Reaction and a Positive Sachs-Georgi Reaction.*—There were forty-eight specimens of blood serum from as many individuals that gave a negative or doubtful Wassermann reaction and a positive Sachs-Georgi reaction. These specimens constituted 26.5 per cent. of the total number of serums giving a positive Sachs-Georgi reaction.

The great importance of ascertaining whether the individuals from whom the blood serum was obtained were syphilitic is obvious, and a very careful and searching inquiry was made into the history and symptoms of each case, with the following results:

Of the forty-eight individuals giving a positive Sachs-Georgi and a negative Wassermann reaction, no less than forty, or 83.3 per cent., gave no history of syphilitic infection and presented no signs or symptoms of the disease. Five of the individuals were known syphilitic patients and in three of the cases no information could be obtained.

Our investigation, therefore, demonstrated that forty of a total of 181 positive Sachs-Georgi reactions, or 22.1 per cent., were undoubtedly false reactions and were not confirmed by the Wassermann test or the history or symptoms of the patients from whom the blood was obtained, and that five of the total 181 positive Sachs-Georgi reactions, or 2.7 per cent., were in known cases of syphilis in which the Wassermann test was doubtful or negative. In three of these cases, the Wassermann test gave a plus-minus reaction and their history showed them to be old latent infections.

### VARIATIONS IN THE RESULTS OF THE SACHS-GEORGI TEST

In our experience, a very noticeable characteristic of the Sachs-Georgi reaction was its variation in results on specimens of blood serum obtained from the same patient but examined at different times. A few examples of this variability are given in the subjoined case reports.

### REPORT OF CASES

CASE 1.—P. S., a man, was in the hospital for a mild respiratory infection. His blood serum gave a negative Wassermann reaction and a very strongly positive Sachs-Georgi reaction when first examined. There was a negative history as to syphilis, and no clinical symptoms. Three weeks later, after discharge from hospital, his blood serum still gave a negative Wassermann reaction, but this time a negative Sachs-Georgi reaction was obtained.

CASE 2.—Mrs. W. had no history or evidence of syphilis. The blood serum gave a double plus Wassermann reaction and a negative Sachs-Georgi reaction. The second Wassermann test, ten days later, gave a double plus Wassermann reaction and a negative Sachs-Georgi reaction. The third Wassermann test, three weeks later, gave a strong plus Wassermann reaction and a strongly positive Sachs-Georgi reaction.

CASE 3.—R. E. L. had a known case of syphilitic infection. The blood serum of this patient gave, at different times, two double plus Wassermann reactions and two negative Sachs-Georgi reactions. A third test resulted in a very strong plus Wassermann reaction and a strongly positive Sachs-Georgi reaction.

CASE 4.—The first test on the blood serum in this patient gave a double plus Wassermann reaction and a plus Sachs-Georgi reaction. There was a history of an abortion and a stillbirth, probably syphilitic in origin. A second test made, twelve days later, resulted in a double plus Wassermann reaction and a clean cut negative Sachs-Georgi reaction.

The cases just cited are only a few examples of the many variations that were obtained with the Sachs-Georgi reaction when several tests were made on the blood serum of the same individual at different times, variations so marked that they could not be explained by any normal variation in the reacting substances in the serum examined. Indeed, if repeated tests had been made on the entire number of individuals examined, it is quite possible that the percentage of variations in the results obtained with this test would have been so pronounced and so confusing as to cause very grave doubt as to the real diagnostic value of the test in any one case. This is a phase of the subject that should receive further investigation.

### SUMMARY AND CONCLUSIONS

1. The results of parallel Sachs-Georgi and Wassermann reactions on 1,748 specimens of blood serum from as many individuals gave a total agreement in results of 85.5 per cent.

2. The disagreements, however, were most serious, no less than 33.3 per cent. of the positive Wassermann reactions being missed by the Sachs-Georgi test in known infections with syphilis, while 26.5 per cent. of the positive Sachs-Georgi reactions were not confirmed by the Wassermann test nor by clinical findings.

3. These disagreements in tests performed under ideal conditions for comparison, by two separate investigators, were so radical in character and so important from a diagnostic standpoint, that we do not believe that the Sachs-Georgi reaction *alone* should be relied on as a diagnostic method for syphilis under any conditions.

4. The difficulty of reading slight Sachs-Georgi reactions and differentiating them from precipitation due to other causes in the serum tested is so great, in many instances, that no reliable conclusion can be reached, thus leaving the test open to so much individual interpretation that it destroys the scientific value of the results. The widely divergent results with the test reported in the literature are conclusive proof of this statement.

5. The Sachs-Georgi test, using the technic recommended by the originators, or slight modifications of this technic, is an interesting reaction from a theoretical and speculative standpoint; but it is greatly inferior, in its practical application to the diagnosis of syphilis, to the Wassermann test or any of its accepted modifications.

6. The Sachs-Georgi test should never be used to the exclusion of the Wassermann test in the diagnosis of syphilis, and a positive result with the Sachs-Georgi test should always be checked up by a Wassermann test.

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**Effect of Altitude on Human Life.**—The eight investigators, five of them Harvard Medical School graduates and the other three British, who sailed for Peru last November to make their headquarters at Cerro de Pasco (altitude 14,200 feet, in the Andes) for the purpose of studying the changes in the heart, circulation, respiration, and chemical composition of the blood which enable the residents to live in comfort at an altitude at which most people could hardly exist on account of rarity of the air, have made a report. An improvised laboratory was taken in the baggage car, and blood tests of the inhabitants were taken, by which it was shown that these people live under conditions in which blood does not contain the usual quantity of oxygen. They are able to carry heavy burdens up sharp inclines at this altitude without exhaustion. The blood tests taken gave some insight into the chemical changes which take place in the blood to make this possible. The members of the expedition were: Dr. Alfred C. Redfield, Arlie B. Bock, Henry S. Forbes, Boston; Carl A. L. Binger, George Harrop, New York; Prof. Joseph Barcroft, Cambridge University, England, who organized the expedition; Prof. J. G. Meakins, Edinburgh University, Scotland, and Dr. Doggart of Kings College, Cambridge. The expedition was financed by Kings College, Cambridge, Royal Society of London, Carnegie Foundation, Rockefeller Institute, the Presbyterian Hospital, New York, University of Toronto, Harvard Medical School, and certain private individuals.

# CARCINOMA OF THE LARYNX TREATED LOCALLY WITH RADIUM EMANATION

A CLINICAL REPORT

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Radium and its salts continually give off a gas, created by the disintegration of the radium atoms, called emanation, which sends forth the same rays that radium does. The amount of emanation issuing from a gram of radium is called a curie, that coming from a milligram of radium, a millicurie. A millicurie is the exact equivalent in irradiating power of a milligram of radium. Radium emanation is collected from a gram, or more, of radium chlorid by means of a mercury vacuum pump which forces it into sealed glass capillary tubes, the thickness of a horsehair and 1/3 inch (8.5 mm.) long. Up to 400 millicuries of emanation, the equal of 400 mg. of raduim, may thus be condensed in one emanation tube, from 50 to 100 millicuries being, however, the usual amount. The glass emanation tubes are enclosed in little silver enameled tubes, 5/8 inch (15.8 mm.) long and 1/32 inch (0.8 mm.) thick, placed for use in small silver containers called screens (Fig. 1), which are made to hold from one to six enameled tubes. Thus, a four tube screen may contain even 1,600 millicuries of emanation (from 250 to 300 being the standard amount), giving the utmost irradiating power in the least possible space. This is of the greatest importance in intralaryngeal work. In contrast to the compactness of emanation, the container for only 30 mg. of radium is already too large for the larynx, filling it up, yet giving an ineffectively feeble irradiation. Radium itself is, therefore, unfit for intralaryngeal irradiation.[1]

Fig. 1.—A four tube Simpson radium emanation screen, natural size.

## APPARATUS FOR INTRALARYNGEAL EMANATION IRRADIATION

In order to irradiate the cancer strongly enough, and yet avoid undue reaction in the throat, the screen must be placed in contact with the cancer, or as close to it as possible. This demand is fulfilled by my apparatus for placing emanation in the larynx, which I have perfected during the last three years. The instruments consist of a forehead clamp (Figs. 2 *A* and 3), a screen holder called the laryngeal applicator (Fig. 2 *B*) and the screens mentioned. The applicator consists of a stem to be held in the clamp, a horizontal body and a distal portion, with laryngeal bend called the screen tube, ending in a socket to hold the screen. The applicator stem has a hinge (Fig. 2 *B*), giving it a forward and backward movement to permit moving the screen in those directions in the larynx without opening the clamp. The hinge is fixed by a set-screw. Another set-screw locks a pivot joint (Fig. 2 *C*) at the base of the applicator stem that permits rotation of the body of the applicator to the right or left. The body of the applicator has a thumbpiece (Fig. 2 *D*) for holding the applicator during its introduction. This ends in a socket (Fig. 2 *G*) into which screen tubes, of varying lengths enabling them to reach into varying depths of the larynx and upper trachea, are fastened by means of a set-screw. A flat steel spring (Fig. 2 *E*) extends between the thumb-piece and socket portion of the applicator body, thus forming the horizontal portion of the applicator. Above the spring, projecting face to face from thumb-piece and socket portion of the applicator, are two short lengths of metal tube. They are joined by a length of rubber tubing slipped over each of them (Fig. 2 *F*), thus forming a continuous tube extending from the screen holder through the screen tube, rubber tube and thumbpiece to a pump attachment (Fig. 2 *K*). This permits the pumping away of saliva or mucus from the larynx. As the applicator must be made rigid for introduction a tubular rod is slipped through the rubber tube and its attachments for the purpose of fixing the spring. When the screen is in place, this rod may be withdrawn, thereby releasing the spring and making the applicator elastic so that it may yield to possible motions of the larynx, thus avoiding friction in unquiet throats.

The screen holders are of two types: socket screen holders (Fig. 2 *L*), into which the screen fits exactly, and notch screen holders, seldom used, which will hold any size screen, but with slight motion. The screens are wired in the holders and cannot come off. The clamp (Figs. 2 *A* and 3) holds the applicator in the larynx by its long stem. It is fastened to the head by a broad leather head-band, held by a heavy clamp, and has rubber lined jaws to keep the stem of the applicator from slipping. The jaws are long to permit free motion of the stem, and hence of the screen, forward and backward in the larynx. A cog-wheel track allows the whole clamp to travel sidewise to meet the applicator stem with open jaws, when the screen is placed where wanted in the larynx. It was found that moving the clamp to meet the applicator stem displaced the screen in the larynx, causing retching. An assistant manages the clamp.

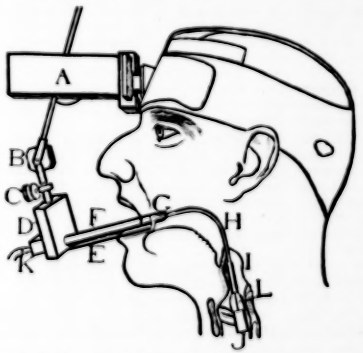


Fig. 2.—Head clamp and laryngeal radium applicator, on which is overlaid an outline of the head, neck and sagittally divided larynx to show how the screen is held in the larynx; *A*, head clamp; *B*, stem of applicator with hinge and set-screw; *C*, pivot joint with set-screw; *D*, thumb piece for hold applicator during introduction; *E*, spring, forming horizontal part or body of applicator when tubular stiffening rod is withdrawn; *F*, rubber tube connecting thumbpiece and socket for screen tube; *G*, socket for screen tube; *H*, screen tube; *I*, epiglottis; *J*, emanation screen lying against vocal cord; *K*, suction pump connection inserted in tubular stiffening rod, and *L*, screen holder with screen wired in.

1. Those wishing more than this brief reference to the qualities of radium may find their full description in the recent book of Dr. Frank Edward Simpson, entitled "Radium Therapy."

### TECHNIC OF TREATMENT

*Local Anesthesia.*—Anesthesin powder is blown upon the oropharynx and base of the tongue, after which 5 per cent. cocain solution is sprayed into the larynx. Pure flake cocain is then swabbed upon the cords, or, if the irradiation takes place from there, into the fossa piriformis. If local anesthesia does not quiet the throat sufficiently, a hypodermic injection of morphin, from ⅛ to ⅓ grain (0.0081 to 0.0216 gm.), will subdue the reflexes.

*Introduction of Screen.*—This is done with the laryngeal mirror, the screen being placed in the position indicated by the site of the cancer, either in the glottis, below the glottis or in the fossa piriformis. If, as happens in rare cases, in spite of local anesthesia or morphin, the screen is not tolerated in the glottis, irradiation may be carried on from the fossa piriformis. It will be effective, even in the case of a cancer of a cord, since the inner edge of the nearest cord is only from ¼ to ⅜ inch (6.3 to 9.5 mm.) distant from the fossa piriformis, and the rays from a 200 millicurie screen easily pass through the entire larynx.

*Dosage.* — Two factors enter into the calculation of dosage: the duration of irradiation and the number of millicuries used. To indicate the proportion of time and dose, the convenient term "millicurie hours" is often employed. This term means irradiation by a certain number of millicuries for one hour or a proportionately greater number of millicuries for a fraction of an hour. For example, 100 millicuries used for one hour are designated as 100 millicurie hours, or 400 millicuries for a quarter of an hour are also designated as 100 millicurie hours. Since these two procedures are not the same, however, because a concentrated dose of emanation for a fraction of an hour gives a more intense irradiation with more reaction than an equivalent dose in millicurie hours for a longer time, the term millicurie hour is inaccurate, and, to be very exact, the dose should be expressed as so many millicuries in so many minutes or hours. The dose I have found best in the average laryngeal cancer is from 200 to 300 millicuries for one hour, repeated from every three to seven days until from 600 to 750 millicuries have been used. The reaction is usually moderate, and there is rapid vanishing of the cancer.

Early carcinomas or soft medullary ones may disappear after only one treatment of 250 millicuries for one hour. However, this result must not be trusted, and irradiation up to the full dose should be given, even though it causes a sharp reaction.

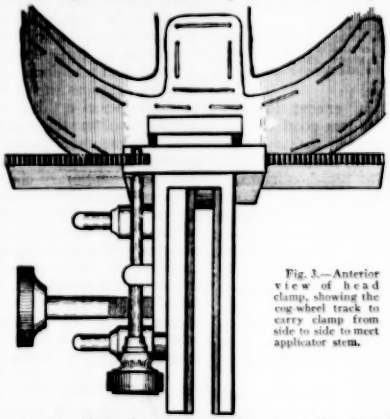

Fig. 3.—Anterior view of head clamp, showing the cog wheel track to carry clamp from side to side to meet applicator stem.

### RESULTS OF TREATMENT

*Intralaryngeal Tumors and External Irradiation.*—Strong irradiation through the walls of the larynx from without will, in my experience, temporarily remove innocent growths, but a return is to be expected in a month or two. For laryngeal cancer, external irradiation is much too feeble.

*Selective Action of the Rays.*—Unlike the knife, caustics and diathermy, which sacrifice a wide zone of normal tissues with the cancer, the radium rays in suitable dose kill only the cancer cells, leaving the normal tissues transiently inflamed but unhurt. Cancer cells of low vitality, as those of medullary cancers, are quickly killed by irradiation. The more vigorous cells of some squamous-cell cancers offer greater resistance, and strong irradiation with much consequent reaction may be needed to remove them, while in a few cases the cancer cells have nearly the vitality of the normal cells, so that the irradiation merely checks the growth, which renews its advance when the cancer cells have recovered their power to multiply. Thus, the proportionate vitality of the tissue cells and the cancer cells largely determines the patient's outlook for relief. Fortunately, the tissue cells are nearly always the strongest; emanation irradiation then results in some marvelous triumphs. Hidden, immobile cords emerge from their concealment in the melting carcinoma, white, intact and with restored motion; the voice returns, and breathing becomes free. A proof that the cancer cells destroy mostly by pressure is this astonishing reappearance, unhurt, of the normal parts, even in advanced growths. If the pressure lasts too long, however, the cords become destroyed by atrophy or become permanently fixed.

*Radium Reaction.* — No effect of the radium rays on the normal tissues is seen until from five to ten days after the irradiation, when the radium reaction starts, with reddening of the cords, slight cough and sore throat. It gradually increases until about the twelfth or fourteenth day, remains on a level for a week longer and disappears in two weeks more. If the cancer lies deep in the tissues, some edema may occur during the height of the reaction. While most reactions are mild, exceptional patients are highly sensitive to radium rays and have prolonged intense reaction with severe dysphagia, the production of a tough, clinging, white false membrane on the mucous membrane, and pain shooting to the ears. This may follow even mild doses of from only 150 to 200 millicuries for an hour, in the larynx. Superficial erosions and a good deal of edema may occur. These unpleasant results always disappear in time. Obstinate ulcers, so-called burns, did not occur in my cases. The death of the cells of many scattered cancerous foci deep in the substance of the larynx may also create intense reaction with much edema.

When deep-seated unilateral arytenoid swelling, with pain radiating to the ears and on swallowing, develops some time after apparent cure of the cancer by irradiation, the condition may resemble a renewed, so-called secondary reaction. While such reactions do occur, in my experience the renewed symptoms have always been due to a resumption of growth of the cancer, and the indication is for immediate and strong re-irradiation.

*Influence of a Preceding Course of Irradiation on the Reaction from a Subsequent Course.*—In my experience, two weeks after the reaction from a course of irradiation has completely subsided, a second one will cause no more reaction than if the tissues had not been irradiated. This is of great value, as it permits vigorous irradiation of possible relapses, as is shown by the complete removal of recurrences in my list of cases.

PROGNOSIS

Early superficial cancers on the cords or in the arytenoid region, with unimpaired cord motion, give the best outlook after irradiation, except in very resistant cancers. The prognosis is less good when a cord is fixed and when deep edema of the arytenoid and ventricular band region reveals entrance of the cancer into the laryngeal muscles or perichondrium.

Fig. 4.—Very large medullary cancer arising from the left aryepiglottic fold and epiglottis, in a man, aged 56.

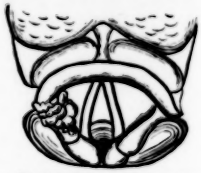

Fig. 5.—The same patient, five weeks after intralaryngeal radium emanation irradiation. All of the growth except a remnant on the left aryepiglottic fold is gone.

Scirrhous cancer, with retracting distortion of the laryngeal interior but no edema and with little visible neoplasm, was found favorable for irradiation, as also were soft cancers of rapid growth, with little penetration and large tumor formation. Squamous-cell carcinomas, with a white, fuzzy surface, may be obstinate, especially when they cause pain and deep swelling. An unfavorable symptom is intense, prolonged reaction, with edema and false membrane formation, as it shows either weak resistance to radium by the tissues or multiple, deep cancer foci.

While an early stage of a laryngeal cancer is essential to its successful surgical removal, it is, while desirable, of less moment in the removal of the growth by emanation irradiation, for here the greater or less resistance of the cancer and tissue cells to the radium rays is the important factor. For this reason, a number of old and advanced cancers in my list vanished readily under irradiation, while some, apparently favorable ones, were resistant.

*Carcinomatous Invasion of Submaxillary and Cervical Lymph Glands.*—Early glandular carcinosis usually yields readily to external irradiation from a distance, with from 500 to 1,000 millicuries for seventeen hours, as employed by Dr. Frank E. Simpson and Dr. Roy Flesher. The outlook is bad when all of one side of the neck, including the inferior triangles, is filled with gland cancers and when paralysis of the recurrent laryngeal and hypoglossal nerves reveals deep neck invasion.

*Laryngofissure, Implantation of Emanation Seeds, Radium Needles.*—By those who do not use the apparatus here described, laryngofissure is still being performed to place emanation in the larynx. Three patients were referred to me for irradiation after this operation. Its effect on all of them was unfavorable, the growth soon making enormous progress after being checked, in spite of irradiation.

Permanent implantation into the larynx of so-called emanation seeds, that is the introduction, with a hollow needle of minute glass bulbs holding about 1 millicurie of emanation, into the tissues, is not suitable for laryngeal cancer. The seeds, being unscreened, cause sloughs where they touch the tissues, but irradiate no farther because of their feeble charge of emanation, so that the mass of the cancer and its microscopically invaded surroundings go untreated.

Hollow needles charged with radium or emanation also cause sloughs, but large, dangerous ones liable to lead to erosion of arteries and uncontrollable bleeding.

CLINICAL REPORT

There were thirty-two cancers of the larynx in the patients treated by intralaryngeal irradiation. Three of these patients were moribund when received, and soon died. In thirteen patients, including those that were moribund, the disease was far advanced when the treatment was begun. In twelve cases, it was also advanced, so that in twenty-five of the patients treated the cancer was in an advanced stage. In only seven was it in an early stage. Four of the cancers were very resistant to irradiation. In two of these, early hopeful progress was followed by no further response to the rays; in a third, there was an excessively prolonged reaction which had not ceased when the patient died of pneumonia. In the fourth case, after temporary improvement, the cancer progressed irresistably, with only temporary checks until the patient died.

In eleven patients, speedy, complete disappearance of the cancer and its symptoms was followed by a return of the growth, the average time between the last irradiation and the return being four and one-half months. In seven of these patients, the advanced state of the cancers predisposed to a relapse, all being of the type called inoperable, with large tumors and deep invasion of the tissues. In four of these recurrences, the cancer was again removed by renewed irradiation, with no second relapse so far, and a fifth was being successfully treated when the patient died of heart failure. These four cases, with ten in which the cancer disappeared without return after the first irradiation, make fourteen patients from whom the cancer was completely eliminated, or fourteen patients among thirty-two who became clinically well. Deducting the three moribund patients from this list leaves fourteen patients of twenty-nine, or close to 50 per cent., who recovered clinically, a good percentage considering that in twenty-five of the thirty-two patients the cancer was in an advanced stage of development, and that thirteen of the patients had extrinsic cancers, that is, cancers that were inoperable by laryngectomy

Fig. 6.—Deep-seated cancer at the seat of the right vocal cord, causing cord to be fixed, in a woman, aged 42.

Fig. 7.—Larynx shown in Figure 6. All trace of carcinoma gone; both cords movable; voice returned, clear and strong.

There were twelve patients who died: seven as a direct result of the cancer, five from general causes. Six patients abandoned treatment before its completion, their further histories being unknown. Deep invasion of the neck and metastases proved fatal in four cases; while in three, external irradiation of the lymph glands of the neck removed cancerous tumors formed in them.

The intralaryngeal irradiation here described was begun, Nov. 1, 1919. Ever since, the apparatus has been improved from crude beginnings to its present efficiency, which gives an exactness of application and a laryngeal tolerance not obtainable in the first year of supply has also increased so that the utmost usable dose is always obtainable, a condition not existing in the first year. It is reasonable, therefore, to expect a better average of results than shown here.

Fig. 8.—Very advanced cancer of the larynx in a man, aged 70; tracheotomy.

My experience has confirmed my opinion that emanation irradiation used as described is the best existing treatment for carcinoma of the larynx; in spite of possible recurrences. The successful re-irradiation of recurrent growths has made the outlook in regard to them unexpectedly favorable.

General surgeons of note, seemingly unaware of what may be done with emanation in laryngeal cancer, still urge laryngectomy as the only treatment. Laryngectomy offers the patient, but only in the early stage of laryngeal cancer, fair security against a return. It deprives him of speech, voice, nasal breathing and the sense of smell. It compels him to breathe through a hole in his neck. In contrast, emanation causes the cancer to vanish by its selective destruction, leaving the normal tissues intact. It often restores speech and the normal structure of the larynx. The penetration of the rays clears away not only the cancer but also the hidden cancer foci that may nest in its surroundings, which the knife cannot reach. It offers the patient, as far as my present experience shows, about a 50 per cent. chance of being freed of the cancer, either at once or by the irradiation of recurrences. Therefore, emanation should be the first, and laryngectomy the last, resort in laryngeal cancer.

## REPORT OF FOUR TYPICAL CASES[2]

CASE 1.—*Large medullary cancer of the larynx, removed by irradiation; no return.* A man, aged 56, referred by Dr. G. W. Boot, Aug. 27, 1921, six months previously had developed cancerous glands on the left side of the neck. They were excised by Dr. Boot. The microscope revealed cancer. The patient swallowed and breathed with difficulty. He had constant pain in the right upper arm and shoulder. Examination revealed a huge cancerous mass filling the pharynx, from the base of the tongue to the posterior pharyngeal wall (Fig. 4). From August 30 to September 6, he was treated with a dosage of 473 millicurie hours (time, three hours and twenty minutes) by a screen thrust into the soft growth. October 8, all of the growth had gone but a small remnant on the left aryepiglottic fold (Fig. 5). Swallowing and breathing were now perfect. November 8, a remnant was growing. From November 11 to November 18, he was treated with a dosage of 375½ millicurie hours (time, two hours and thirteen minutes) applied in the larynx. December 3, the tumor was entirely gone; the throat looked normal. February 10, the patient died of cerebral metastasis. Pain in the arm was due to metastasis in the medullary canal of the humerus.

CASE 2.—*Cancer of the right fossa piriformis removed by irradiation; no return.* A man, aged 59, was seen Aug. 23, 1921. The right fossa piriformis was filled by cancer. There were edema of the right arytenoid region and an enlarged gland behind the point of the jaw. From August 23 to September 10, he was treated with a dosage of 442 millicurie hours (time, three hours ten minutes), with a screen in the fossa piriformis. September 10, all trace of growth was gone. Preventive treatment of 179 millicurie hours was given. Aug. 12, 1922, the throat was normal.

CASE 3.—*Scirrhous cancer of the right half of the larynx; recovery; no return.* A woman, aged 46, was seen, Nov. 12, 1921. She had been hoarse from the spring of 1920 until August, 1921, when she became voiceless, with pain shooting to the right ear. Examination revealed the right cord hidden by the ventricular band which was lifted by an underlying growth. The right half of the larynx was immobile (Fig. 6). A hard gland was felt in the right carotid region. The diagnosis was deep invasion of the larynx by the retracting type of scirrhous cancer. From November 16 to December 20, a dosage of 471 millicurie hours (time, two hours and fifty-three minutes) was given. Jan. 5, 1922, the right cord had come to view. Both cords looked normal and moved normally (Fig. 7). Voice had returned. July 25, the voice was loud and clear. There had been no recurrence. A general surgeon had intended to perform a hemilaryngectomy on this patient just before she came for intralaryngeal irradiation.

CASE 4.—*Large intrinsic cancer of the larynx; tracheotomy; relapse; final recovery.* A man, aged 60, examined, June 27, 1921. The left side of the larynx was motionless, the right side showed some motion. All features of the laryngeal interior were merged into a diffiuse, convoluted mass. Stenosis and dyspnea were present. No trace of the cords could be found (Fig. 8). There were enlarged glands in the left carotid region and an ulcer on the site of the right cord. The diagnosis was advanced scirrhous cancer. Two external treatments were given in an attempt to open the larynx for intralaryngeal irradiation. July 2, a small screen, 63 millicuries, was placed in the stenotic glottic opening. July 12, reaction had narrowed the laryngeal lumen. There was urgent dyspnea and a low tracheotomy was performed. From July 26 to August 8, 443 millicurie hours of intralaryngeal irradiation was given. The time was three hours. August 9, the carcinoma had disappeared. There was a clear view down the trachea. Nov. 4, 1921, the larynx was wide open. The cords appeared as white, immobile, cicatricially fixed bands. There was no tumor (Fig. 9). The tracheotomy tube had been removed since August. December 6, there was a recurrence, with marked laryngeal stenosis. From the level of the glottis, down for three tracheal rings, was seen a mound of white, tough, foul-smelling exudate, firmly attached to the tracheal and laryngeal posterior walls, filling all but the anterior third of the laryngeal and tracheal lumen. It had to be cut away with the laryngeal punch to give breathing space. The arytenoids were enormously swollen; there was great pain. The prognosis seemed hopeless in this return of the carcinoma. From December 8 to January 13, 1922, a dosage of 628 millicurie hours was given, the screen lying on the exudate from its lowest point in the trachea. There were several weeks of constant, severe pain, with slow disappearance of the exudate and swelling. January 31, the

Fig. 9.—The same larynx as in Figure 7; one relapse, in January, 1922, which vanished after second irradiation; larynx has remained free from cancer ever since; cords cicatricially fixed.

2. Lack of space has compelled the omission from this article of the reports of all but four typical cases. The rest, except the last four, will appear in the Transactions of the American Laryngological Association for 1922. Illustrations of only three cases are reproduced here, but the illustrations of fourteen other cases may be found in the transactions mentioned and in the reprints of this articles.

pain, swelling and exudate were gone. The larynx was again free from cancer (Fig. 9). April 1, the laryngeal interior remained healthy; the patient was in robust health. No report of return has been received so far, July 30.

## NOTE ON THE USE OF EPINEPHRIN IN HEART BLOCK *

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Phear and Parkinson [1] recently reported a case of complete heart block in which the sudden ventricular standstill responsible for syncopal attacks was entirely prevented by the subcutaneous injection of epinephrin. The heart block and the auricular and ventricular rates remained unchanged. Their review of the continental literature discloses only two cases, one of partial (2:1) block, the other of complete block, in which heart block was reduced or abated by epinephrin. In no case was partial heart block increased in degree, but in nearly all instances the auricular and ventricular rates were accelerated. Experimentally, however, it was shown by Kahn that complete auriculoventricular block may be produced in dogs by the intravenous injection of epinephrin. The paradoxical results reported by Routier, who describes a deblocking effect of epinephrin in dogs in which complete block had been produced by crushing the auriculoventricular bundle, failed of confirmation in the hands of Hardoy and Houssay and Clerc and Pezzi. Experimentally, also, the auricular and ventricular rates are usually accelerated by the drug.

The experience of Parkinson led one of us (C. D. C.) to suggest a trial of epinephrin in the case of heart block here described, although at the time the patient was free from syncopal attacks.

### REPORT OF CASE

A woman, aged 56, had suffered for several years from a choking sensation while eating, often accompanied by nausea and vomiting, sometimes followed by faintness and complete loss of consciousness. The slightest exertion was sufficient to bring on severe air hunger. She was aware of the fact that her pulse was always very slow. Nothing to account for heart block could be discovered in the history.

On examination there was no enlargement of any of the chambers of the heart, nor any valvular defect. The ventricular rate was unusually slow. The beat of the auricles was not audible over the precordia, and the auricular component of the jugular pulse was lacking. The peripheral pulse was regular, rhythmic, monocrotic and "celer" in character. The systolic blood pressure varied between 140 and 175, and the diastolic between 65 and 80. There were no other physical findings of importance.

The blood Wassermann reaction was negative on three separate occasions. The patient received a total of 0.532 gm. of red mercuric iodid by intramuscular injection, during a period of thirty-four days, without effect on the heart block. Atropin, given to full physiologic effect, produced no change in the block or the ventricular rate.

Electrocardiograms substantiated the clinical diagnosis of heart block. From time to time the block varied in degree from partial (always 2:1) to complete. When complete heart block was present, the ventricular rate varied between 25 and 35 a minute. The highest rate recorded was 60 a minute, occurring during a period of incomplete block.

The effect of epinephrin is summarized in the accompanying table. In addition, epinephrin was twice tried without electrocardiographic control. On these occasions the highest ventricular rate recorded, including premature beats, was 56 a minute. The original rate had returned within four hours after the injection. Death from inhibition of the ventricle occurred three days after the last experiment with epinephrin, before opportunity had been afforded to try the effect of this drug on the atropinized heart. Permission for necropsy was not given.

### COMMENT

Interest in this case centers about three points: (1) increase in degree of auriculoventricular block; (2) increase in auricular and ventricular rates, and (3) production of auricular arrhythmia.

It is clear that the vagus was in no way responsible for the patient's heart block, as full atropinization was without effect. The immediate change from partial to complete block under epinephrin, however, was a central vagus effect. Although circumstances did not permit us to prove this directly by testing the epinephrin effect on the atropinized heart, it is fully substantiated by the experimental observation [2] that

EFFECT OF EPINEPHRIN

| No. | Time | Degree of Block | Rate * | | Premature Ventricular Beats | Blood Pressure | |
|---|---|---|---|---|---|---|---|
| | | | Auricle | Ventricle | | Systolic | Diastolic |
| Control | 3:20 | Partial 2:1 | 70 | 35 | None | 140 | 78 |
| | 3:30 | Ten minims of 1:1,000 solution of epinephrin injected intramuscularly | | | | | |
| 1 | 3:33 | Complete | 100 | 40 | None | 154 | 80 |
| 2 | .... | Complete | Extremely arrhythmic | 41.6 | Occasional | 158 | 82 |
| 3 | .... | Complete | Extremely arrhythmic | 40 | Prominent | 154 | 78 |
| 4 | .... | Partial 2:1 | Extremely arrhythmic | 45 | Prominent | 152 | 74 |
| 5 A | .... | Complete | Extremely arrhythmic | 40 | Prominent | .... | .. |
| 5 B | .... | Partial 2:1 | 94 | 47 | Prominent | .... | .. |
| 6 | .... | Partial 2:1 | 102 | 51 | Prominent | 142 | 68 |
| 7 | .... | Partial 2:1 | 96 | 48 | Prominent | .... | .. |
| 8 | 3:45 | Partial 2:1 | Extremely arrhythmic | .. | Prominent | .... | .. |

* Exclusive of premature beats.

auriculoventricular block is not produced by epinephrin if the vagi have been cut. The vagi, therefore, retained a certain amount of tone, irrespective of the preexisting partial heart block. Production of auriculoventricular block in a patient by the action of epinephrin has not been previously described, so far as we are aware; but it cannot be considered an anomalous occurrence in view of the fact that epinephrin is known to stimulate the vagus strongly. In fact, from the available experimental data, it is much easier to explain the production of heart block by epinephrin than it is to understand how the reverse effect may be obtained. It becomes necessary, therefore, to accord this fact important consideration in dealing with cases of heart block.

It has been shown by Meek and Eyster,[3] and Hoskins and Lovelette,[4] that the mechanism of epinephrin action on the heart rate is probably twofold: it accelerates by direct stimulation and inhibits reflexly through the vagus. If the vagi possess good tone the resultant of these opposing actions is a slowing, but

* From the Medical Clinic of Lakeside Hospital and Western Reserve University.

1. Phear, A. G., and Parkinson, J.: Lancet **1**: 933 (May 13) 1922.

2. Lewis: Mechanism and Graphic Registration of the Heart Beat, Shaw and Sons, 1920, p. 164.

3. Meek and Eyster: Am. J. Physiol. **38**: 62, 1915.

4. Hoskins and Lovelette: The Adrenals and the Pulse Rate, J. A. M. A. **63**: 316 (July 25) 1914.

if the vagus tone is low the heart is usually accelerated. Vagal slowing is conditioned chiefly on rise of intra-aortic pressure. In our patient, although the blood pressure was somewhat raised, a striking increase in auricular and ventricular rates took place. This result points clearly to a considerable lowering of vagal tone.

The extreme auricular arrhythmia manifested under epinephrin is due primarily to disturbance in vagal tone referable to the central epinephrin effect and to variations which take place with each arterial pulse. Additional factors may be the raised ventricular rate and disturbance in ventricular rhythm caused by numerous premature beats. Systole of the ventricle is known to influence impulse formation in the auricle, and this influence is most apparent in auriculoventricular block.[5]

SUMMARY

1. There are on record a few instances in which epinephrin reduced or abolished auriculoventricular block. The report of our case illustrates the fact that epinephrin may also increase a preexisting partial auriculoventricular block. The increase is probably a central vagus effect. The mechanism by which epinephrin reduces auriculoventricular block is not clear.

2. Increase in auricular and ventricular rates, excitation of premature ventricular beats and production of extreme auricular arrhythmia may be brought about by the action of epinephrin on a heart which is the seat of auriculoventricular block.

## Clinical Notes, Suggestions, and New Instruments

### INTRA-ABDOMINAL HEMORRHAGE FROM STOMACH DUE TO OSTEOPATHIC TREATMENT: REPORT OF CASE

B. J. O'NEILL, B.S., M.D., AND W. W. CRAWFORD, M.D.,
SAN DIEGO, CALIF.

This case is reported because it illustrates one of the possible dangers of indiscriminate mechanotherapy.

*History.*—A woman, aged 22, single, eleven hours before admission, had been seized with severe abdominal pain and slight vomiting shortly after eating radishes, which had always disagreed with her. A person calling himself an osteologist, and claiming to be an improvement over the osteopath, was called in and subjected her to vigorous abdominal massage, followed by manipulation of the neck. To accomplish this, he threw her face downward over his knee, striking her abdomen against his knee. This caused an immediate increase in the abdominal pain, of such a degree that the osteologist was ordered out of the house. Pain continued, became colicky in character, and vomiting increased. The patient was taken to the hospital for treatment. The past history was negative, except for some indigestion and some slight pain on menstruation.

*Examination.*—The patient was well developed and well nourished. She was lying on her back with the knees drawn up. She was extremely pale, presenting a picture of collapse, with short and gasping respiration. She complained of pain over the entire abdomen, which increased on deep respiration. The abdomen was rigid and tender, the condition being rather more marked below the umbilicus. There was movable fluid in the flanks. The heart and lungs were normal; there was no vaginal flow; the hymen was intact. The white blood corpuscles numbered 12,500; polymorphonuclears, 92 per cent.; red blood corpuscles, 3,136,000; hemoglobin, 80 per cent. (Tallqvist).

*Treatment and Result.*—Diagnosis of probable ruptured appendix was made and immediate laparotomy undertaken. When the abdomen was opened, slightly to the right of the median line, there was a gush of bright red blood and about 3 pints (1.5 liters) of fluid and clotted blood was removed with the fingers, swabs and pump, the clots being of varying consistency, none more than a few hours old. Careful exploration of the abdomen and pelvis revealed no abnormalities except a bleeding point on the greater curvature of the stomach; some adhesions about the gallbladder and appendix, which was small, fibrous and kinked in the middle, and a small cyst of the right ovary. The fallopian tubes were normal. The stomach extended below the umbilicus, and there was bleeding from a ruptured branch of the gastro-epiploic vein on the anterior surface of the stomach, about half an inch from the border of the stomach, at the point at which the stomach crossed the spinal column. This was tied with fine catgut. Toilet of the peritoneum was completed, and the abdomen was closed with a small rubber drainage tube in the pelvis. Recovery was uneventful.

At present, one year after operation, the patient is in good condition, except for some indigestion, probably due to chronic appendicitis.

A damage suit against the osteologist was decided in his favor by a jury, who apparently adopted the view that the bleeding was caused by vomiting.

824 First National Bank Building.

5. Lewis (Footnote 2) p. 177.

### ARTIFICIAL PNEUMOTHORAX COMPLICATED BY HYDRO-PNEUMOTHORAX AND PLEURISY WITH EFFUSION ON THE UNTREATED SIDE: REPORT OF TWO CASES

LEROY S. PETERS, M.D., ALBUQUERQUE, N. M.

There are few reports in the literature of the coexistence of bilateral pleurisy with effusion. In fact, it is one of the rarest complications in pulmonary tuberculosis. Stivelman [1] reported a close search of the literature, and could find but two cases, one reported by Als [2] and one by Fishberg,[3] the latter being the first one in the English language. Zemmin [4] reported one in 1921, which, with Stivelman's case, brings the number up to four. Two have occurred in my practice during the administration of artificial pneumothorax:

CASE 1.—One of these came under my observation while I was associated with the late Dr. A. G. Shortle at the Albuquerque Sanatorium, six years ago. The records of this case were accidentally destroyed by fire, but I remember the essential details. The patient was started on pneumothorax treatment at Colorado Springs, fluid developing on the treated side before he came to Albuquerque. While he was on the train, marked dyspnea developed, and when seen by us his discomfort was extreme. Examination revealed a well compressed left lung, with dulness over the right lung from the fourth rib to the base. Aspiration of 2 quarts (liters) of serous fluid gave him immediate relief, and there was no further accumulation. This patient died later of complications not referable to the pneumothorax.

CASE 2.—The other patient, admitted four years ago, was under my care at St. Joseph Sanatorium, Albuquerque. At that time she gave a history of active tuberculosis, extending back two years. A few months prior to consulting me she had gone through a normal pregnancy, but the disease had become more active after delivery. The left lung was completely involved, with cavity formation in the upper lobe, and there was a moderate infiltration in the right upper lobe. The daily average maximum temperature was 100 F. During the entire period of her history she had had repeated hemorrhages, and a pneumothorax was advised. This was easily produced and continued for nearly a year, when fluid formed on the compressed side. This later became purulent, but at no time could we demonstrate a mixed infection, and as far as symptoms were concerned there was no evidence of the change from a serous to a purulent exudate. This

1. Stivelman, B. P.: Am. J. M. Sc. **162**: 270 (Aug.) 1921.
2. Als, E. (Ztschr. f. Tuberk. **31**: 333 [Feb.] 1920), cited by Stivelman.
3. Fishberg, M. (Am. Rev. Tubere. **4**: 649 [Nov.] 1920), cited by Stivelman.
4. Zemmin: Beitr. z. Klin. d. Tuberk. **47**: 169 (April 11) 1921.

gradually became organized. In a short time, fluid formed on the treated side, the patient complained of dyspnea, and examination revealed fluid on the untreated side, the level being at the nipple line. One quart of a serous exudate was removed, with relief of symptoms and no return of the fluid formation. This patient has been under observation four years, under pneumothorax treatment two years of that time, and today the case is well arrested, no pneumothorax treatment having been given for two years.

### COMMENT

It is interesting to note that in each case the one aspiration was sufficient, and that there was no further accumulation of fluid on the untreated side. The cases differ from Fishberg's, however, in that there was no absorption of the fluid on the treated side.

Another interesting feature in each of our cases is the fact that, with the available breathing space very much restricted, the patients showed no signs of cyanosis. It is true that the first patient was extremely dyspneic at all times until relieved by aspiration, but the second was fairly comfortable, except on exertion.

We can see no reason for discontinuing the pneumothorax treatment as noted by Fishberg. In both patients the refills were kept up, in one for only a few months, owing to his death from other complications, and in the other for nearly a year after the formation of fluid on the untreated side.

## A NEW APPROACH TO THE SEMILUNAR CARTILAGES

PERCY WILLARD ROBERTS, M.D., NEW YORK

Believing that the period of convalescence following operation for excision of the semilunar cartilages of the knee could be shortened by early mobilization of the joint, I have, during the last two years, been using an approach which eliminates strain on the wound when the knee is flexed and obviates the necessity of suturing the synovial membrane. All but one of the eight patients thus far operated on at the Hospital for Ruptured and Crippled have been able to walk without crutches and to sit with the knee flexed to a right angle on the sixth day, and to resume their usual activities, with practically full joint function, at the end of two weeks.

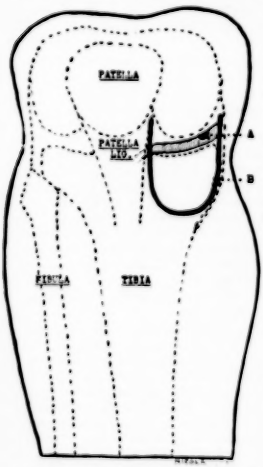


Fig. 1.—Line of incision for excision of internal semilunar cartilage; *A*, internal semilunar cartilage; *B*, line of incision.

In all joint cases in which the part is immobilized for a considerable time after operation, psychology is a factor in retarding recovery. There is always present the fear of injuring the joint when it is moved; and especially is this true if motion is at all painful. To prevent this, it has been my custom to explain to the patient before operation what the after-treatment will be. He is told that motion within the limit of pain will stimulate the circulation and prevent swelling, thus shortening his stay in the hospital, and that he will be expected to move the joint as soon as he comes out of the anesthesia and to repeat this every two hours. Passive motion is prohibited. Strange to say, there is practically no discomfort accompanying this early mobilization and much less swelling than when the knee is splinted. It is, therefore, easy to maintain the patients' cooperation, and occasionally it is necessary to restrain them in their ambition to increase the arc of flexion too rapidly.

The purpose of this approach is to so place the wound that no strain will come on it when the knee is bent. This is accomplished by using a blunt V-shaped incision, one arm of which starts about three eighths of an inch above the upper border of the tibial condyle, and follows down the border of the patellar ligament for an inch and a half. The knife is then carried transversely for a short distance, and then upward, inside of the lateral ligament to the level of the upper end of the opposite arm, as shown in Figure 1. All tissues overlying the tibia, including the periosteum, are cut at the same time. A sharp periosteal elevator is used to raise the V-shaped flap, which is retracted upward until the coronary ligament is exposed. This is incised transversely at its attachment to the tibia. As retraction is continued, the lower surface of the meniscus will appear on the under surface of the flap, as shown in Figure 2. The cartilage is now grasped by forceps and, with a narrow-bladed knife, is dissected out. The wound is closed by several interrupted chromic gut sutures approximating the margins of the periosteum and other fibrous structures. Pulling down the flap closes the transverse opening in the synovial membrane, and no sutures are required. The skin is closed with silk. The firm suturing of the periosteum and adjacent structures prevents any strain on the skin wound even when the knee is flexed to 90 degrees, and there is, therefore, no interference with repair. Should stitch infection occur, as happened in one of my cases, the wound is so far removed from the joint that there is no occasion for anxiety. In this particular case, the patient was discharged with practically normal function at the end of two weeks.

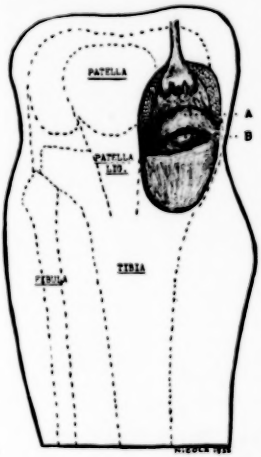


Fig. 2.—Flap retracted upward, showing exposure of meniscus on its under surface; *A*, internal semilunar cartilage; *B*, medial condyle of femur.

Removal of a meniscus by this method requires a little more time than by more direct incisions, but the difference is so slight it is not worth consideration in view of the rapid convalescence which ensues.

576 Fifth Avenue.

## HEMORRHAGIC DISEASE OF THE NEW-BORN WITH DIRECT TRANSFUSION INTO LONGITUDINAL SINUS THROUGH ANTERIOR FONTANEL

JOHN A. SHOEMAKER, M.D., BEREA, OHIO

Mrs. L. S., aged 32, a normal secundipara, was delivered normally of an 8 pound girl, Aug. 21, 1922, after three hours' labor in the hospital. The baby's life was entirely uneventful until August 24, when, at 3:30 p. m., the attending physician was called to the hospital with the urgent message that the baby had vomited an immense quantity of blood, which had soaked through the mother's gown and into the bedding. The baby had nursed a few minutes previously, and was about to be returned to the nursery. From 3:30 to 4:30

p. m., it had three more hemorrhages from the stomach, bright red and rather profuse. Between 4:30 and 5:30, three large bowel movements almost entirely of blood were passed. This, however, was dark and in the form of large clots.

The following measures were taken in sequence: 20 grains (1.3 gm.) of calcium lactate, given by mouth; a subcutaneous injection, 10 c.c. of a thromboplastic serum, into the left shoulder; physiologic sodium chlorid solution by rectal drip, and hypodermoclysis of 250 c.c. of physiologic sodium chlorid solution under the breasts. At 5:30 p. m., Dr. Hull of Elyria, with my assistance, gave 30 c.c. of whole blood from the father by direct transfusion, from the median basilic vein into the longitudinal sinus of the infant through the anterior fontanel. These measures checked the hemorrhage; color was restored to the skin, and the pulse became of greater volume, although it remained at 130. At 8 p. m., the child had another large bowel movement of dark blood, but there were no more hemorrhages from the stomach after 4:30 p. m. Two hundred cubic centimeters of 5 per cent. glucose was given by bowel at six-hour intervals after transfusion. August 25, at 6 a. m., the child was resting well and had taken 2 ounces (60 c.c.) of water every two hours. There had been no hematemesis during the night. The rectum was packed full of dark clotted blood, which prevented the use of the glucose solution. The child's skin was yellow and translucent; the pulse was 100, but of small volume. There was some cyanosis of the nails, and the respirations were shallow, almost imperceptible. The baby was allowed to nurse at 6:30 a. m. Rectal irrigations were ordered to clean out the clotted blood in the rectum. At noon, the baby had nursed normally, its pulse had improved, and it had slept quietly all the morning. There was a pinkish tinge to the skin. At 6:30 p. m., there was a passage by bowel of a large quantity of red-brown blood, indicating a possible oozing from the site of the hemorrhage in the gastric mucosa; and, as a matter of safety, 10 c.c. of thromboplastic serum was given under the skin of the back. There had been no emesis during the day, and the child's condition was slightly better.

August 26, the baby nursed well all day and seemed to be better. After nursing time, 6 p. m., there was evacuated an immense quantity of old and fresh blood by rectum. The infant became cyanotic and cold, with breathing shallow and skin translucent. The pulse was 140 and small. Ten cubic centimeters of thromboplastic serum was again given, and, between 9:30 and 11 p. m., 35 c.c. of the father's blood was again transfused by direct method into the longitudinal sinus. Three punctures of the fontanel were required because, although the transfusing was done quickly, rapid clotting of the father's blood prevented a free flow through the small lumen of the transfusing needle. The baby reacted well after 11:30 p. m., and began to suck its thumb. From August 27 until its discharge from the hospital, August 31, the baby rapidly grew better, nursed normally, and from a loss of more than 1 pound (453 gm.) in weight, began to gain an ounce (28 gm.) a day. The first normal yellow stool, free from old blood, was passed, August 29. The recovery was very rapid and apparently complete. In all, 30 c.c. of thromboplastic serum and 65 c.c. of whole blood had been given. The hemorrhage was in each instance checked by the serum and the blood content restored by the transfusion. It was estimated that the infant lost not less than 8 ounces (236 c.c.) of blood.

### CONCLUSIONS

In the treatment of these hemorrhages occurring in the new-born, which may quickly destroy life, prompt and efficient measures are necessary. It has been found that calcium lactate is of practically no value in the emergency. Thromboplastic serum, in any of the commercial forms accepted by the Council on Pharmacy and Chemistry, acts promptly as a hemostatic agent if used in sufficiently large doses. It should be followed, whenever possible, by whole blood transfusion, without loss of time. The whole blood not only supplies the fibrin ferments, but also stimulates bone marrow and, at least partially, restores the normal blood content.

It is our opinion that the gastric hemorrhage in this case was checked by the thromboplastic serum, and fully controlled, and a recurrence prevented by the whole blood transfusion. The use of the physiologic sodium chlorid solution to restore the volume of the circulating medium and of glucose solution to counteract shock is valuable, but not indispensable.

## New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

**TETANUS ANTITOXIN, CONCENTRATED** (See New and Nonofficial Remedies, 1922, p. 281).

E. R. Squibb and Sons, New York.

*Tetanus Antitoxin, Purified.*—(See New and Nonofficial Remedies, 1922, p. 282). Also marketed in syringe containers of 10,000 units.

**STAPHYLOCOCCUS VACCINE** (See New and Nonofficial Remedies, 1922, p. 306).

E. R. Squibb and Sons, New York.

*Staphylococcus Vaccine.*—Marketed in packages of four syringes containing, respectively, 100, 250, 500 and 1,000 million killed *Staphylococcus aureus* and *Staphylococcus albus* in equal proportion; in packages of four ampules containing, respectively, 100, 250, 500 and 1,000 million killed *Staphylococcus aureus* and *albus* in equal proportion (with a syringe); and in vials of 5 Cc., 10 Cc. and 20 Cc., each cubic centimeter containing 5,000 million killed *Staphylococcus aureus* and *Staphylococcus albus* in equal proportion.

**STREPTOCOCCUS VACCINE** (See New and Nonofficial Remedies, 1922, p. 308).

E. R. Squibb and Sons, New York.

*Streptococcus Vaccine.*—Marketed in packages of four syringes containing, respectively, 100, 250, 500 and 1,000 million killed streptococci; in packages of four ampules containing, respectively, 100, 250, 500 and 1,000 million killed streptococci (with a syringe); and in vials of 5 Cc., 10 Cc. and 20 Cc., each cubic centimeter containing 1,000 million killed streptococci.

**TYPHOID VACCINE** (See New and Nonofficial Remedies, 1922, p. 310).

E. R. Squibb and Sons, New York.

*Typhoid Vaccine.*—Marketed in packages of four syringes containing, respectively, 100, 250, 500 and 1,000 million killed typhoid bacilli; in packages of four ampules containing, respectively, 100, 250, 500 and 1,000 million killed typhoid bacilli (with a syringe); and in vials of 5 Cc., 10 Cc. and 20 Cc., each cubic centimeter containing 1,000 million killed typhoid bacilli.

*Typhoid Vaccine Combined, Immunizing.*—Marketed in packages of three syringes, one containing 500 million killed typhoid bacilli and 375 million each of killed paratyphoid A and paratyphoid B bacilli, and each of the other two syringes containing 1,000 million killed typhoid bacilli and 750 million each of killed paratyphoid A and paratyphoid B bacilli; in packages of three ampules containing, respectively, the same dosages as the three-syringe package (with a syringe); in packages of 30 ampules, hospital size; and in vials of 5 Cc., 10 Cc., and 20 Cc., each cubic centimeter containing 2,500 million killed bacilli.

**MIXED BACTERIAL VACCINES** (See New and Nonofficial Remedies, 1922, p. 314).

E. R. Squibb and Sons, New York.

*Staphylo-Acne Vaccine.*—Marketed in packages of four syringes, the first containing a mixture of 50 million each of killed *Staphylococcus albus*, of killed *Staphylococcus aureus* and of killed *acne bacilli*, the second containing a mixture of 125 million each of killed *Staphylococcus albus*, of killed *Staphylococcus aureus* and of killed *acne bacilli*, the third containing a mixture of 250 million each of killed *Staphylococcus albus*, of killed *Staphylococcus aureus* and killed *acne bacilli*, the fourth containing 500 million each of killed *Staphylococcus albus*, of killed *Staphylococcus aureus* and of killed *acne bacilli*; in packages of four ampules containing the same dosages as the four-syringe package (with a syringe); and in vials of 5 Cc., 10 Cc. and 20 Cc., each cubic centimeter containing 1,500 million killed bacteria.

**COLON BACILLUS VACCINE** (See New and Nonofficial Remedies, 1922, p. 299).

E. R. Squibb and Sons, New York.

*Colon Vaccine.*—Marketed in packages of four syringes containing, respectively, 100, 250, 500 and 1,000 million killed bacilli; in packages of four ampules containing, respectively, 100, 250, 500 and 1,000 million killed bacilli (with a syringe); and in vials of 5 Cc., 10 Cc. and 20 Cc., each cubic centimeter containing 5,000 million killed bacilli.

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SATURDAY, NOVEMBER 4, 1922

## RACIAL FACTORS IN BLOOD PRESSURE

Determination of blood pressure has become a procedure of importance in the practice of medicine. One may not agree entirely with Cabot's [1] dictum that "though one of the simplest, it is the most important of all medical tests." The variability in the findings of physicians attests the crudeness of many of the current measurements of blood pressure in man, so that it almost appears at times as if simplicity and speed had been substituted for calculated accuracy. Furthermore, it seems rash to overlook the readings of the clinical thermometer, and the counting of the pulse rate, not to mention other indispensable helps in the every-day routine of medical practice. Nevertheless, the estimation of blood pressure has truly gained a prominent place in diagnostic technic; and the information which it has furnished has helped to awaken a tremendous interest in the large problem of arterial hypertension and related factors.

As is true in the study of most newly discovered functions or newly perfected devices, many of the earlier investigations of blood pressure in man were directed to ascertain the norms. Out of the thousands upon thousands of manometric readings have arisen the statistics which form the present basis for judging the possible meaning of data secured in the individual case. Age, size, sex, season, activity—these and numerous other factors likely to alter the circulatory apparatus of man have been taken into consideration. It is not so generally known that racial variations appear to exist. Among the Orientals, the measurements made by McCay [2] on Hindus from Lower Bengal, and the data secured at various times for the Filipinos,[3] for example, point uniformly to comparatively low systolic pressure in natives living in the Eastern tropics. Cadbury [4] has more recently compiled the facts for Cantonese and other Chinese young men from the south of China. Their systolic blood pressure averages from 20 to 30 mm. of mercury less than the normal for people in Europe and North America. The diastolic pressure of the Chinese is also lower than the generally accepted normal, but by only 10 to 20 mm. The Filipinos' diastolic pressure seems to be higher. The average pulse pressure shows little variation from the generally accepted normal, and is, therefore, relatively high.

It is said that hypertension as a pathologic condition in the Chinese is very unusual.[4] This challenges attention to the low normal arterial blood pressure of the race, and leads one to inquire into the possible factors that may account for it. Are they applicable to our own conditions of climate, race and civilization? Cadbury has excluded the widely used opium, and likewise physical or muscular inferiority, as an explanation, because his best statistics were gathered from active, healthy students beyond the reproach of these implications of drug addiction or poor physique. Small stature and lighter body weight may play a part. The relatively simple diet, largely vegetable in character and including little meat, cannot be overlooked as a possible contributory influence. "Simplicity of life" and "absence of nervous strain" are claims which it is difficult to evaluate in terms of etiologic significance. Several writers have suggested that the secretory function of the skin is increased, and probably the normal surface resistance and vasomotor tension necessary to produce the required surface heat of temperate climates is greatly diminished in the tropics the year round. To detect the fundamental factor responsible for the vascular conditions in the Chinese might mean the discovery of the best way to avert hypertension among our people.

1. Cabot, R. C.: A Layman's Handbook of Medicine, Boston, Houghton, Mifflin Company, 1916, p. 172.
2. McCay, D.: Lancet **1**: 1483, 1907. Scientific Memoirs, Govt. of India, No. 34, p. 23, 1908.
3. Musgrave, W. E., and Sison, A. G.: Philippine J. Sc. B. **5**: 325, 1910. Chamberlain, W. P.: Philippine J. Sc. B. **6**: 467, 1911. Concepcion, I., and Bulatao, E.: Philippine J. Sc. B. **11**: 135, 1916.
4. Cadbury, W. W.: The Blood Pressure of Normal Cantonese Students, Arch. Int. Med. **30**: 362 (Sept.) 1922.

## BERIBERI TODAY

The problem of neuritis in the tropics is not a new one. Beriberi was first described, from East Indian cases, by the Dutch physicians Jacob Bontius [1] and Nicholas Tulp [2] centuries ago. And it was again a Dutch scientist, Dr. C. Eijkman, now professor of hygiene at the University of Utrecht, who first produced experimentally through dietary measures a disease of polyneuritic character which resembles the tropical malady beriberi. Those who gather their information and impressions about tropical diseases from the printed page, and have become educated in the seeming simplicity of the modern vitamin hypotheses in relation to malnutrition and disease, might assume that beriberi should be well nigh eradicated by this time, or at any rate that it need no longer be a matter of very serious medical concern in those places where intelligent forces can be brought into operation. Consequently, it may come as somewhat of a surprise to learn from those expert in this field of study that, among the problems of tropical pathology, that of neuritis is one of the

1. Bontius: De Medicina Indorum, Leyden, 1642, pp. 115-120.
2. Tulp: Observationes Medicae, Amsterdam, 1652, pp. 300-305.

most interesting, baffling and important and, furthermore, that it is far from being solved.[3] In referring to the enormous literature of the subject, they even venture the assertion that perhaps in no other field is so much uncontrolled, incomplete or unreliable work used as a basis for so many varied and often unwarranted conclusions. As if to afford added emphasis to the alleged situation comes the report that the first indigenous cases of beriberi in the history of Porto Rico, our own recently acquired insular possession, seem to have proceeded from United States draft troops recruited from that island as late as 1918.[4] In fact, scarcely a year has elapsed since an investigation was ordered of the alarming disability on account of polyneuritis.

Certain possible aspects of the etiology of beriberi remain to challenge the clinical investigator. Ashford has concluded that the Porto Rican outbreak of polyneuritis among our soldiers is some form of beriberi, probably, as he believes, a "combination of the beriberi syndrome plus a physiologic deficiency in the glandular system due to chronic protein starvation from relative deficiency in food containing the complete protein molecule." The theory of infectious origin, so popular a few years ago in the Far East, has received careful consideration at San Juan, and has been ruled out. Similarly, other environmental factors involving general conditions of sanitation, climate and less well defined hygienic influences lack the proof of serious importance in the unexpected genesis of beriberi in Porto Rico; and the same is true of intoxications with alcohol or other poisons known to affect the peripheral nervous system adversely. Ashford has concluded that the disease has been self-induced in certain men who, with a ration containing a sufficiency of protective substances, have elected to satisfy their appetites by eating inordinate quantities of highly milled rice at the expense of foods richer in the missing essential food factors. Economic and sociological circumstances have contributed to this outcome. The recruits for the army, coming from districts where of late years the growing of vegetables has greatly decreased, have become accustomed to somewhat one-sided diets, in the choice of which they persist despite the greater variety of diet offered by the army ration. The treatment has been the enforcement of a regimen richer in "protective" foods.

Musgrave and Crowell also are inclined to abandon the theories of a bacteriologic or an intoxicant origin of beriberi. They insist that the treatment of the disease should be both symptomatic and specific, a dictum that applies to almost every malady. Without pronounced enthusiasm for the dietary management of beriberi as dictated by the modern study of vitamins, Musgrave and Crowell nevertheless assert that for beriberi patients a glass of milk is a better "tonic" than all the drugs in the pharmacopeia. The hypothesis of dietary deficiency is truly being tried in these days. Who shall say that it has been found wanting?

3. Musgrave, W. E., and Crowell, B. C.: A Clinical and Pathological Study of Neuritis in the Tropics, with Special Reference to Beriberi, Am. J. M. Sc. **164**: 227 (Aug.) 1922.
4. Ashford, B. K.: Beriberi in the Garrison at San Juan, Porto Rico, Am. J. Trop. Dis. **2**: 305 (July) 1922.

## THE CULTIVATION OF TISSUE CELLS

The extravital cultivation of tissue cells is a comparatively new accomplishment of the biologic sciences. Scarcely a dozen years have elapsed since Harrison [1] published the outcome of his pioneer experiments on the ameboid outgrowth of fibers from isolated nerve cells in vitro. This has not remained an isolated accomplishment. Connective tissue cells and epithelium also have shown a capacity for uninterrupted reproduction in isolated masses, notably in the hands of Carrel and his associates at the Rockefeller Institute, provided the environmental conditions are made favorable for the microscopic structures under investigation. The technic of such studies involves experimentation of a high degree of refinement, in which asepsis is an added requisite. Heretofore, one essential of the method of obtaining a pure strain of any type of tissue cell has consisted in the isolation of tissues for cultivation from portions of the organism where they may be obtained free from any other organized tissue elements.

Only recently, Fischer [2] has succeeded on this principle in cultivating in vitro a strain of cartilage cells, obtained from the pars cartilago sclerae of the eye of chick embryos. The hyaline substance characteristic of cartilage disappeared during the cultivation in vitro, the cells growing independently without forming any hyaline material under these conditions. Even more striking, however, is the recent accomplishment of Carrel and Ebeling [3] in securing pure cultures of leukocytes, which has just been announced.

It has been said that pure strains of cells are as necessary in the study of physiologic problems as pure cultures of micro-organisms are in bacteriology. The possibility of making rigorous tests of such assertions seems to be near at hand. The cells grown by Carrel and Ebeling were large mononuclear leukocytes isolated from the blood and kept in various mediums. The smaller cells, so-called lymphocytes, disappeared from the cultures, possibly being transformed into the larger forms. This point is still uncertain. But there seems to be no doubt that the large mononuclears may be changed into cells having all the appearances of fibroblasts. They exhibited a tendency to tissue formation which lymphocytes do not show. Such differentiation is an additional indication of the interrelation of the blood and connective tissue, a topic lately sub-

1. Harrison, R. G.: J. Exper. Zool. **9**: 784, 1910.
2. Fischer, A.: A Pure Strain of Cartilage Cells in vitro, J. Exper. Med. **36**: 379 (Oct.) 1922.
3. Carrel, Alexis, and Ebeling, A. H.: Pure Cultures of Large Mononuclear Leukocytes, J. Exper. Med. **36**: 362 (Oct.) 1922.

jected to critical review by Sabin.[4] What the experimental in vitro transformation of one kind of cell into another may ultimately mean for science and for medicine can scarcely even be conjectured at the present moment.

Almost equally fascinating is the demonstration of how the growth of isolated cells in cultures can be facilitated or retarded. Thus, the activity of the large mononuclears was increased in Carrel and Ebeling's recent experiments by embryonic tissue juice, and inhibited by homologous serum. Perhaps it is the latter which normally prevents the organism from being overrun with leukocytes continually proliferating. Carrel[5] has long since shown that embryonic cells yield substances which stimulate cell proliferation. Quite recently, he[6] has made the interesting discovery that leukocytes secrete substances in vitro which promote cell multiplication. Peritoneal exudate or connective tissue invaded by leukocytes acquires the power of increasing the rate of multiplication of fibroblasts. Leukocytes are thus capable of bringing growth-activating substances to tissue cells. Perhaps, as Carrel believes, they have the important function of promoting cell multiplication in the parts of the organism in which they accumulate under certain conditions. Considerations like the foregoing emphasize the potent possibilities, dictated by the outcome of studies of cells in pure culture, of restraining the growth of neoplasms, of accelerating tissue repair, or altering the metabolism of special cells, among other things, in the human organism.

## EXPERIMENTAL EPIDEMIOLOGY

Sydenham defined disease as "an effort of Nature, striving with all her might to restore the patient by the elimination of morbific matter," an implication of the modern idea of disease as a struggle for existence between invading micro-organisms and those factors residing in the body which make for immunity. The development of bacteriology emphasized the desirability of keeping the harmful germs away from the individual—of preventing disease by eliminating or restraining its causative agents. The accomplishments of public hygiene in this direction have undoubtedly been most significant; yet the hopes of many health officials have been somewhat disappointed because infectious ailments have not been eliminated in civilized communities. They have failed, however, to reckon with the innumerable unknown modes of invasion. Thus, the menace of the healthy carrier of infectious micro-organisms was scarcely recognized a generation ago; and, year by year, new sources of bacterial danger are being brought to notice. The great epidemics of meningitis or cerebrospinal fever, poliomyelitis, influenza and epidemic encephalitis, ravaging even the countries in which the medical sciences and protective arts have been most assiduously cultivated, have brought discouragement to many.

One outcome of the modern development of epidemiology has been to direct greater attention to the individual himself. It has become clearer that if his microbial enemies cannot be kept away successfully, he himself must be better prepared to cope with them. Thus, the study of artificial, acquired immunity is being fostered in increasing measure. Garrison[1] has remarked that opinion is divided between those who maintain that the prevention of disease and mortality rests mainly with the individual, and those who believe that causation and prevention are multiplex and largely external to the individual; so, in the infantile science of epidemiology, just emerging from the descriptive stage, he adds, there are already two schools, one relying on the bacterial theory of infection for its data, and one, headed by Crookshank, harking back to the Sydenham doctrine of epidemic constitutions, family relationships between diseases, and external (cosmic and telluric) phenomena as contributory causes of epidemics.

Flexner[2] likewise has discovered a reaction in certain quarters against the teachings of modern bacteriologic epidemiology. That this return to older, and as it must seem, more mystical doctrines is widespread cannot be affirmed, he concludes, but it has even happened that in the effort to elucidate the epidemic prevalences of the last two decades already enumerated and eventuating in the colossal outbreak of influenza, the notions of epidemic constitutions as defined by Hippocrates, and especially by Sydenham, have been more or less sported with, if not actually invoked. Flexner contends that the way to the understanding of the enormous complexity of interrelation between microbe and host and their reaction on each other is not through a return to the "indefinite concepts of epidemic constitutions" but through further investigation of the phenomena out of which a real science of epidemiology can finally be built.

Accordingly, he has fostered an elaborate experimental study of epidemic outbursts of disease among colonies of animals under conditions of control not attainable with man. The earliest of these novel researches relate to a gastro-intestinal infection in mice. They have already shown that not only do specific differences exist among so-called mouse typhoid bacilli, but all the pathogenic varieties appear extremely labile. Strains of the bacilli artificially enhanced as they pass from mice to mice quickly fall to an average of infectivity and are, as it seems, at low pathogenic ebb at the time of the death of the infected animals. But this

4. Sabin, Florence: On the Origin of the Cells of the Blood, Physiol. Rev. **2**: 28 (Jan.) 1922.
5. Carrel, Alexis: J. Exper. Med. **18**: 287, 1913; **17**: 14, 1913. Carrel, Alexis, and Ebeling, A. H.: Ibid. **34**: 317 (Oct.) 1921.
6. Carrel, Alexis: Growth-Promoting Function of Leukocytes, J. Exper. Med. **36**: 385 (Oct.) 1922.

1. Garrison, F. H.: The History of Medicine, Philadelphia, 1922, p. 748.
2. Flexner, Simon: Experimental Epidemiology, J. Exper. Med. **36**: 9 (July) 1922.

lability of the bacilli is determined, in part, by the hosts; that is, the mice through which they pass. In this respect, mice may be viewed as consisting of different biologic classes according as they respond to ingestion of the bacilli with infection and death, with mere carriage of the bacilli, or with nonreactability. The distinctions of classes are not, however, absolute, but are determined, partly at least, by the quantity of dosage of the bacilli. It is the latter factor which plays so conspicuous a part in the phenomenon of recurrent epidemic waves superinduced by the introduction of new mice in the replacement experiments described. While it is the "carrier" among the old mice which provides the "seed" for the next following epidemic outbursts, it is the highly susceptible individuals among the new which furnish the living "culture" medium enabling rapid increase and wide dissemination of the bacilli to be effected, just as it is the succumbing and nonreactable mice which check the growth and multiplication that tend to arrest the epidemic spread. The outcome of these studies, in which Amoss [3] has collaborated, will be awaited with interest. The demonstration, already accomplished, of the rôle of the influx of new uninfected population in maintaining epidemic waves is itself of the foremost significance.

## Current Comment

### THE ORIGIN OF VITAMIN A

One of the interesting and physiologically important features with respect to vitamins is the apparently well substantiated fact that they are not synthesized in the organism of the higher animals or man. Consequently, the latter are dependent in ultimate analysis on extraneous sources for these dietary essentials. It is obviously of great importance to know the origin of any product that is indispensable to human or animal welfare. In the case of vitamin A it has become evident that the green plant plays a significant part in the production of the food factor, just as the vegetable kingdom has long been known to synthesize other essentials of diet which the animal organism cannot construct *de novo*. According to the observations of Coward and Drummond [4] in England, dry seeds and etiolated shoots grown away from the sunlight may be inactive as sources of vitamin A, whereas the green shoots are often very potent, suggesting that the formation of large amounts of this vitamin requires the influence of light. Studies with *Tradescantia* have indicated, further, that vitamin A can actually be produced by the green plant from inorganic sources. We need not necessarily include sunlight in the requirement, since the recent demonstration by Harvey [5] at the University of Minnesota, where a great variety of plants, including several varieties of wheat, oats, barley, rye and potatoes, buckwheat, lettuce, beans, peas, clovers, radishes, flax and a number of common weeds, were grown from seed to seed entirely in artificial light. It thus becomes clear how the higher land animals and man draw their supplies of vitamin A directly or otherwise from green plants, since their own tissues seem to lack the power to manufacture it. But how about the marine animals, which appear in many cases to be particularly rich in vitamin A? Investigation has demonstrated that among their sources of foods the marine algae share with land plants the power to synthesize it. And most recently the production of large amounts of vitamin A by pure cultures of diatoms in sterilized sea water has been discovered.[6] Diatoms are an important source of nutriment for many marine forms, which in turn serve to supply food sources for man. An instructive parallel may be drawn between the dependence of land animals on fresh green leaves and that of marine animals on the synthetic activity of the marine flora for their supplies of vitamin A. Cod liver oil and many other comparable products of marine origin are notably rich in vitamin A. The fishes which furnish these tissue oils live on a great variety of food. Drummond and Zilva [7] have recently remarked that although it would be an almost insuperable task to demonstrate an actual transference of vitamin A right through from a diatom such as *Nitzschia* to its final location in the liver of the cod, it would appear that we are justified in assuming that such transference does indeed take place by relying on the fact that as yet synthesis of this dietary factor by an animal organism has not been demonstrated, whereas such synthesis is readily carried out by certain plants, both marine and terrestrial. Furthermore, the marine algae represent the fundamental food supply of all marine animals.

### PUERPERAL THROMBOSIS AND EMBOLISM

Häggström [8] in a valuable study of puerperal thrombosis and embolism, as observed in the Upsala obstetric clinic during the years 1901 to 1920, says that of 11,475 women in childbed, 149 developed thrombosis, that is, 1.3 per cent.; furthermore, that of the 149 women with thrombosis, thirteen presented symptoms of pulmonary embolism, and six died of pulmonary embolism. In only fifteen of these 149 cases did the thrombosis follow established infection—sepsis, metritis, salpingitis, mastitis, angina; in a still smaller number, other diseases, such as anemia and chronic heart disease, acted as possible predisposing causes; and in a somewhat larger number the thrombosis followed various more or less severe obstetric manipulations or operations; in the majority of cases, however, there was no apparent cause for the thrombosis. Relatively more cases occurred in

3. Amoss, H. L.: Experimental Epidemiology, I. An Artificially Induced Epidemic of Mouse Typhoid, J. Exper. Med. **36**: 25 (July) 1922; II, Effect of the Addition of Healthy Mice to a Population Suffering from Mouse Typhoid, ibid., p. 45.

4. Coward, K. H., and Drummond, J. C.: The Formation of Vitamin A in Living Plant Tissue, Biochem. J. **15**: 530, 1921.

5. Harvey, R. B.: Growth of Plants in Artificial Light from Seed to Seed, Science **56**: 366 (Sept. 29) 1922.

6. Jameson, H. L.; Drummond, J. C., and Coward, K. H.: Synthesis of Vitamin A by a Marine Diatom (Nitzschia Closterium W. Sm.) Growing in Pure Culture, Biochem. J. **16**: 482, 1922.

7. Drummond, J. C., and Zilva, S. S.: The Origin of the Vitamin A in Fish Oils and Fish Liver Oils, Biochem. J. **16**: 518, 1922.

8. Häggström, Paul: Uber puerperale Thrombosen und Embolism, Upsala Läkareförenings Handlingar **27**: 305-351 (Sept.) 1922.

older women and in multiparae. The veins of the left leg were affected fifty-four times, of the right, fifty-five times, and of both sides, twenty-four times; in the remaining cases the thrombosis was located in the pelvic or vulvar veins or the location was not given. In four of the six fatal cases of pulmonary embolism, the primary thrombosis was situated in the pelvic veins. The local symptoms of puerperal thrombosis depend on its location. In pelvic thrombosis there may be no local symptoms noted, while in thrombosis of the larger veins of the lower extremities the symptoms and signs may be more or less obvious and it is unnecessary to go into details at this time. According to Häggström, the most important premonitory symptom is a moderate rise in temperature, with a relatively rapid pulse, and whenever this occurs in the puerperium, it is wise to look carefully for thrombosis and to guard the patient against sudden movements or exertion of the body. Obviously, the maintenance of good venous circulation and the avoidance of varicose veins, with a smooth and uncomplicated delivery and puerperium and gradual elevation of the bed toward the foot end are measures that will tend to prevent puerperal thrombosis. When thrombosis occurs, rest in bed, with practically absolute quiet of the affected limb, and no massage, for about two to three weeks after the temperature becomes normal, is essential. The great danger of puerperal thrombosis is pulmonary embolism, which may ensue any time after the thrombus has formed and until connective tissue substitution is well under way. Sometimes the embolism develops without any obvious cause, usually on sudden change of position, on coughing, defecation or urination. Depending on the size of the occluded vessels in the lungs, the symptoms may vary from anxiety, dyspnea, pain in the side, usually the right, with friction rubs, increase in pulse rate and temperature, and bloody sputum, to rapid, sometimes almost instantaneous, death, with violent and stormy symptoms, when the larger branches or main stem of the pulmonary artery is occluded. As shown in Häggström's series, a little less than one half of the patients with definite symptoms of pulmonary embolism died. It is probable that small emboli may lodge in the lungs without causing recognizable symptoms and also that instances of pulmonary embolism are not recognized but are diagnosed as bronchitis or pleuritis. Häggström gives a table of 140,752 births, made up from reports in the literature, principally German, and his own cases, which shows that one case of thrombosis occurred in about 162 births and that approximately one tenth of the cases of thrombosis resulted in pulmonary embolism and the imminent risk of the grave danger to life connected therewith. The full significance of these figures stands forth when they are applied to the population at large. The figures mean that in a country like Sweden, for instance, in which from 125,000 to 135,000 births take place annually, upward of 850 women become bedridden for several weeks each year on account of puerperal thrombosis, and that about sixty women die in childbed each year from pulmonary embolism. Applying the figures to our own country, with approximately 2,450,000 births annually, we reach a total of about 15,000 cases of thrombosis and at least 1,500 cases of pulmonary embolism in childbearing women each year—a danger to and loss of valuable lives calling for the best efforts at prevention that the medical profession can put forth.

## CANCER WEEK

The week of November 12-18 has been selected by the American Society for the Control of Cancer as a period during which special efforts will be made to acquaint the public with the early symptoms of cancer. This education is intended to lead the patient to seek a physician as early as possible, since it is well known that in early eradication lies the only remedy. In various states, special committees have been formed to present every phase of the work. Newspapers, lantern slides, motion pictures, and messages delivered through the churches are being or will be utilized to arouse the public. Physicians are, of course, either leading or lending their aid in the movement. As we have stated before, this attempt to educate the public to the fact that cancer in its early stages is remediable should be continuous and not the forced effort of a week. "Cancer Week" is a splendid means for working enthusiasm to its highest pitch; but this enthusiasm should not be permitted to relapse. There is no health problem more vital than that of arousing the public to the importance of early recognition of cancer.

## THE "WILL TO BELIEVE"—IN 1817

The case of Willetta Huggins, the 17-year-old inmate of the Wisconsin School for the Blind, who is said to be able, although blind, to tell colors, has recently been dealt with at some length, pro and con, in THE JOURNAL. In this connection, the following quotation from the "Memorials of Liverpool" published many years ago by Picton, takes on an added interest:

> A singular physiological problem kept the Liverpool public on the *qui vive* during the autumn of 1817. A Miss M'Avoy, a young lady residing in St. Paul's-square, about seventeen years of age, was attacked by hydrocephalus and partial paralysis. Her eyes were affected by gutta serena, [an old term for amaurosis.—ED.] and she was pronounced by her medical attendants to be entirely blind. Shortly afterwards she was reported to possess the faculty of reading print and distinguishing colours by the touch, her eyes being so completely bandaged as to prevent the possibility of deception. The story got wind, and the house in St. Paul's-square became a centre of attraction to the wonder-loving public. There could be no mercenary object to gain by imposture, as the family were respectable and no money was ever received. Many wonderful accounts were published of her capacity of deciphering the smallest print and the most delicate colours in utter darkness as well as with the eyes covered. Dr. Renwick, a physician of eminence, published a pamphlet, in which he gave explicit credence to the new and supernatural faculty. Encouraged in this way, her pretensions assumed a higher flight. She now claimed the faculty of discerning objects at a distance by placing her fingers behind her upon the glass of the windows and was said in this way to have described the figures of persons in the churchyard opposite and the colour of their clothes. This naturally excited some suspicion, which was strengthened by other circumstances. The interposition of any substance between her face and hands deprived her of the faculty of seeing as it were by touch. This she attributed to the neces-

sity for her breath having free and uninterrupted communication with her hands. To obviate this difficulty an ingenious gentleman (Mr. Egerton Smith) contrived a mask which, whilst entirely covering the eyes and face, left the breathing free and uninterrupted, and offered to pay twenty guineas, which another gentleman doubled, if Miss M'Avoy, with this mask on, could read a single line of moderately sized print. After some equivocation the test was declined, and Miss M'Avoy's pretensions fell to zero and were soon forgotten.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

### ALABAMA

**Tuberculosis Association Formed.**—The annual meeting of the Baldwin County Medical Association was held at Fairhope, October 3, under the presidency of Dr. V. McKeynolds Schowalter. A committee of Baldwin citizens also met and organized the Baldwin County Antituberculosis Association, with Drs. George C. Marlette, county health officer, and Gaines C. McCrary, Foley, as members.

### CALIFORNIA

**Hospital News.**—The second unit of the new St. Francis Hospital building, Santa Barbara, is nearing completion. It will be finished the latter part of November. Building will consume the $140,000 the committee has in hand, and additional funds will be necessary to complete and equip the institution.——The new hospital at Groveland, erected for the Hetch Hetchy Water Supply Company, was opened, October 4. This building was erected to replace the one recently destroyed by fire.——The new Salinas Valley Hospital, Salinas, was formally opened, September 27. Dr. Rollin Reeves is owner of the property.——The Inglewood Hospital, Inglewood, has been purchased by Mrs. Willsie and Mrs. Rogers. The institution will be remodeled and refitted with modern equipment.——The Lincoln Hospital, Los Angeles, will erect a nurses' home in the near future.

### CONNECTICUT

**Yale University News.**—The new Sterling Chemical Laboratory of Yale University will be dedicated, April 4, 1923, during the spring meeting of the American Chemical Society at New Haven. It is a three-story building constructed on three sides of a square. Enclosed in the square is a one-story, saw-tooth roof factory building with movable partitions. This structure can be varied to suit the needs of the teaching staff.——The second oldest professional school of Yale University, the Divinity school, celebrated the one hundredth anniversary of its founding, October 23-25.

**Incidence of Smallpox.**—The largest number of cases of smallpox ever reported in Connecticut during any year have occurred since December, 1921. Up to October 14, of this year, 441 cases had been reported, with six deaths. The epidemic has been exceedingly costly to the state, health officers having to devote their time to this disease, thereby lessening the time that they could give to their routine work. Additional help and police protection were necessary in order to carry out measures to prevent the spread of the disease. Incidentally, the health department states, all the deaths from smallpox which occurred this year were of unvaccinated persons.

### DISTRICT OF COLUMBIA

**Personal.**—Major A. Parker Hitchens, M. C., U. S. Army, delivered an address before the Wapita at Washington, October 4, on the subject of "Vaccination." Dr. Noble P. Barnes presided, and announced that the scheduled election of officers would be deferred until the next meeting.

**American Dietetic Association.**—At the fifth annual meeting of the association, held in Washington, October 16-19, Miss Octavia Hall, Peter Bent Brigham Hospital, Boston, was elected president; Miss Breta Luther, Children's Hospital, Boston, secretary, and Miss Anne Bolder of the Infant Welfare Society, Chicago, treasurer. Drs. Elliott Joslin, Boston, Louis H. Newburgh, Ann Arbor, Mich., and Walter B. Cannon, Harvard University Medical School, were among the speakers.

### FLORIDA

**New Hospital Opened.**—The new Baltzell Hospital at Marianna was recently opened for patients. Dr. Nicholas A. Baltzell is the owner of the institution.

**Woman Physician Elected Mayor.**—Dr. Mary Josie Rogers was recently elected mayor of Daytona. She is the first woman to be elected mayor in Florida, it is stated.

**Joint Medical Meeting.**—A joint meeting of the Florida Midland Medical Society and the Polk County Medical Society was held in Lakeland, October 11, under the presidency of Dr. Gaston H. Edwards, Orlando. The annual election of officers for the midland society resulted in Dr. Burdette Smith, Tampa, being elected president and Dr. Harold M. Beardall, Orlando, secretary-treasurer. The next annual meeting will be held at Sanford.

### GEORGIA

**Physicians Sentenced.**—Dr. Donarell R. Green, Atlanta (colored), was recently sentenced to serve six months in the federal penitentiary, or be fined $500, it is reported, for violation of the Harrison Narcotic Law. Green was alleged to have furnished cocain and other opiates illegally to patients. ——Dr. Leighton Brown, Macon, was sentenced to nine months imprisonment, recently, for violation of the Harrison Narcotic Law, it is reported.

### IDAHO

**South Idaho Medical Society.**—The fall meeting of the society was held in Boise, October 28, under the presidency of Dr. Edward E. Maxey, Boise. Dr. Joseph Aspray, Spokane, was the principal speaker. Dr. Stowell B. Dudley, Caldwell, recently returned from the Near East, spoke on his work as director of medical relief in Europe.

### ILLINOIS

**Public Welfare Conference.**—The annual Illinois Public Welfare Conference will be held in East St. Louis, November 12-14. Sections on public health and mental hygiene will offer programs especially interesting to physicians. The director, assistant director and other members of the state department of public health will participate in the conference.

**Smallpox Incidence Low.**—Smallpox incidence in Illinois since Aug. 1, 1922, has been the lowest in several years. During this period seventy cases were reported to the state department of public health, as compared with ninety-one for last year and 736 for the year before. Of twenty-four cases reported for the first half of October of this year, sixteen occurred in Rock Falls, Whiteside County.

**Correspondence School of Instruction.**—Arrangements have been completed by the state department of public health to conduct a correspondence course of instruction for district health superintendents and local medical health officers. As a supplement to this course, a weekly health index will be placed in the hands of those on the mailing list. The index will consist of a summary of the prevalence of communicable diseases by counties, and a sheet of editorial matter.

**Hospital News.**—An addition is to be erected at the Soldiers' Orphans' Home in Norwood. The institution is conducted by the department of public works.——The Livingston County Tuberculosis Hospital, recently completed at Pontiac, was dedicated, September 24. Dr. F. Herbert Bartlett, formerly of the Healthwin Hospital, South Bend, Ind., is superintendent of the institution.——Trustees and the medical staff of Passavant Memorial Hospital, Jacksonville, held a meeting, recently, to consider the proposed annex to the institution. The new addition will be used exclusively for contagious diseases. It will be erected at the northeast corner of the main structure.——Sister Marie, superintendent of the Huber Memorial Hospital, Pana, has been transferred to New York. Sister Vincent will succeed her.

**Personal.**—Dr. Groves B. Smith, psychiatrist of Gregory, has accepted an assignment offered him by the Commonwealth Fund of New York. He will make a survey of all prisons in New York state before drawing up recommendations to the governor for changes in the penal system regarding abnormal mental states of prisoners. A similar survey

was recently conducted in St. Louis, and about 70 per cent. of the prisoners were found to be suffering from some abnormal mental condition.——Dr. John H. Gordon, Pocahontas, entertained the members of the Bond County Medical Society, October 31, when he celebrated the anniversary of his eightieth birthday.——Dr. John C. McMillan, New Berlin, recently underwent an operation for goiter at Rochester, Minn.——Dr. Eugene Naylor's right index finger was so badly injured in an automobile accident recently that amputation was necessary.——Dr. Elam R. McBroom, Camp Grove, has given up the practice of medicine and has been ordained to the ministry.

### Chicago

**Personal.**—Dr. Frederick A. Besley, Chicago, has been appointed chairman for Illinois to represent the American Society for the Control of Cancer, to aid in the universal celebration of "Cancer Week," November 12-18. Dr. Besley has distributed a circular letter for the instruction and guidance of the county chairmen of the state, pointing out the advisability of appointing local chairmen in each community to acquaint the general public in regard to the early investigation and treatment of cancer.——Dr. Gustav A. Futterer is seriously ill at the Columbus Memorial Hospital. ——A dinner was given for Dr. Bertha Van Hoosen in Chicago, November 7, when she outlined her plans for the work in the Orient that she is undertaking.

**Hospital News.**—The South Shore Hospital has purchased a site at Eightieth Street and Crandon Avenue for a new nurses' home which will be erected in three years.——A new $200,000 building will be erected by the Oak Haven Old People's Home at Western Avenue, it has been announced. ——The cornerstone of the new German Evangelical Hospital at Morgan Street was laid, October 22, with appropriate exercises. The institution will have accommodations for 125 patients and will be erected at a cost of $350,000.—— If the Children's Memorial Hospital can raise the sum of $1,000,000 within two years for an endowment fund, $333,333 will be donated to it, under the will of John P. Wilson, Sr. If the endowment is not subscribed the institution will only receive the sum of $50,000.

### INDIANA

**Banquet for State Society President.**—The Huntington County Medical Society gave a banquet in honor of Dr. Charles H. Good, president of the Indiana State Medical Society, at Huntington, October 12. Invitations were extended to every association in the eleventh district. Dr. Reuben F. Frost acted as toastmaster. Dr. Albert E. Bulson, editor of the *Journal of the Indiana State Medical Association*, and Dr. Warren D. Calvin, president of the Twelfth District Medical Association, gave addresses on this occasion.

### IOWA

**Personal.**—Arthur Holmes, Ph.D., president of Drake University, Des Moines, has been appointed professor of psychology in the University of Pennsylvania, Philadelphia. ——Dr. Albert H. Byfield, professor of pediatrics at Iowa State University, held a children's clinic at St. Joseph's Hospital, Centerville, October 20. He was the guest of the Appanoose County Medical Society.

**Hospital News.**—A petition asking for the erection of a county memorial hospital was recently filed with the board of supervisors of Audubon. A special ballot has been prepared by that body for the general election, when the voters of the county will vote on the issuance of $75,000 in bonds for the erection and equipment of the institution. It will be known as the Liberty Memorial Hospital and will be a community institution, with accommodations for about forty patients. It is to be a memorial to the veterans of the World War.——A campaign to raise $500,000 for the construction of a new Methodist hospital in Sioux City will be conducted in northwest Iowa, it was announced at the Methodist conference, at Fort Dodge, October 6.——Plans are being prepared by Dr. William H. Jenks for the erection of a new hospital on his lots at the north end of Cedar Street, Tipton. ——Plans have been completed for the erection of the new $300,000 Protestant Hospital in Sioux City.

### KANSAS

**Santa Fe Railway Medical and Surgical Society.**—At the twenty-fifth annual meeting of the society held at the Santa Fe Hospital, Topeka, October 14, Dr. Charles Dunning, Arkansas City, was elected president; Drs. H. Clay Manning, Cushing, Okla., Ola Putman, Marceline, and Oliver W. Spicer, Colorado Springs, Colo., vice presidents, and Dr. Mark L. Bishoff, Topeka, secretary-treasurer.

### KENTUCKY

**State Medical Meeting.**—At the seventy-second annual convention of the Kentucky State Medical Association, held at Paducah, October 16-19, under the presidency of Dr. Joseph A. Stucky, Lexington, the following officers were elected for the ensuing year: president, Dr. Frank Boyd, Paducah; vice presidents, Drs. William Barnett Owen, Louisville, Willis R. Moss, Clinton, and Charles R. Tanner, Henderson, and secretary, Dr. Arthur T. McCormack, Louisville. The society went on record as favoring a plan to limit specialization in the practice of medicine to physicians who have had as much as five years' experience in general practice. A resolution was adopted recommending that the University of Kentucky establish a medical school for the accommodation of students unable to obtain admission to the University of Louisville owing to inadequate facilities. Organization of an independent insurance agency to carry protection for accidents to their automobiles was indorsed. Crab Orchard was selected as the next meeting place.

### MARYLAND

**Baltimore County Health Work Planned.**—Physicians and residents of Baltimore County met recently at the Towson courthouse to consider organizing a county health association, to take over the work formerly conducted by the Red Cross. Dr. William E. Bridges, superintendent of Eudowood Sanatorium, was chairman. A committee of five was appointed to confer with officials of the Baltimore County Children's Aid Society and other organizations on forming a health association. The new organization will furnish nursing service throughout the county as did the Red Cross. The committee is composed of Dr. Bridges, Dr. Frank W. Keating, superintendent of Rosewood State Training School, A. D. Stebbins, Dr. W. P. E. Wyse and S. Duncan Black.

### MASSACHUSETTS

**Social Service Work.**—The annual meeting of the Massachusetts Conference of Social Work will be held in Greenfield, November 13-15, under the presidency of Herbert C. Parsons.——The division of social work of the state department of mental disease and the Massachusetts Association for Occupational Therapy have made arrangements whereby convalescent patients may find a market for articles made in occupational therapy work. The state hospital social workers will guide and direct patients in the manufacture of articles suitable for sale, while the bureau of occupational therapy will assist in the sale of such articles.

**Boylston Medical Prizes.**—These prizes, which are offered by Harvard Medical School, are open to public competition for the best dissertation on questions in medical science proposed by the Boylston Medical Committee. For 1922, there is a prize of $500 and the Boylston prize medal, offered for the best dissertation on the results of original research in medicine, the subject to be chosen by the writer. Papers must be in the hands of the secretary, Dr. Reid Hunt, Harvard Medical School, Boston, not later than Dec. 31, 1922. The Boylston prize medal will be added to the money prize only in case the winning essay shows special originality in the investigations detailed.

**Personal.**—Dr. Herman Robbins and Dr. Harry Goldman, both of Boston, have been appointed medical inspectors to carry out the increased demands for aid in the administration of the Schick test.——Dr. Frederick A. Mead, Willimansett, has been elected president of the Holyoke Medical Society. ——Samuel Wesley Stratton, D.Sc., for twenty-one years director of the Bureau of Standards, Washington, D. C., has been elected president of the Massachusetts Institute of Technology, to succeed the late Richard C. MacLaurin.—— Dr. Ayers P. Merrill, Pittsfield, was recently elected president of the four district medical societies of the Massachusetts Medical Society, including Berkshire, Franklin, Hampshire and Hampden counties.

**Mental Hygiene Bureau.**—The new division of mental hygiene, the first government bureau of its kind, it is said, was recently opened in Boston, under the direction of Dr. Douglas A. Thom. Plans have been outlined which will include state-wide research and the establishment of clinics

on mental hygiene in eight or ten of the largest cities, where a survey will be made previously to ascertain the needs, the facilities available and prospects for cooperation. This division was established in the department of mental disease by the legislature of 1922. Dr. Thom has already associated with him, Dr. Harry C. Solomon, research investigator; Dr. Stanley Cobb, professor of neuropathology, Harvard Medical School; Dr. A. Warren Stearns, assistant professor of psychiatry, Tufts Medical School; Dr. Abraham Myerson, professor of neurology, Tufts Medical School, and Dr. George K. Pratt, Boston.

## MINNESOTA

**Minnesota Academy of Ophthalmology and Oto-Laryngology.**—At the meeting of the academy in Minneapolis, October 20, the following officers were installed for the ensuing year: president, Dr. William R. Murray; vice presidents, Drs. Archibald D. McCannel, Minot, N. D., and Henry E. Binger, St. Paul, and secretary-treasurer, Dr. John H. Morse, Minneapolis.

**Mississippi Valley Medical Association.**—At the forty-seventh annual meeting of the association held in Rochester, October 10-12, Dr. Henry Enos Tuley, for twenty-five years secretary of the association, was elected president. Dr. Tuley was unable to attend the sessions, being seriously ill at his home in Louisville, Ky. Dr. John de J. Pemberton of the Mayo Clinic was elected vice president; Dr. John L. Tierney, St. Louis, secretary, and Dr. E. H. Hatton, Chicago, was elected treasurer. The next meeting will be held in Hot Springs, Ark.

**Thirteen Organizations Convene in Twin Cities.**—Every field in health endeavor in Minnesota was represented at the meeting, October 25-27, in St. Paul, of members of all the principal health organizations in the state. New methods of health education and health supervision in the public schools was one of the major subjects discussed. Governor Brumbaugh of Pennsylvania gave three lectures on health subjects during the convention. Among the organizations participating in the conference were: U. S. Public Health Association, the Minnesota Education Association, the American Red Cross, the state sanitary conference, the state public health association, the state board of health, the state board of control, the state advisory committee for tuberculosis, the state dairy and food department, the state live-stock sanitary board, the state sanatorium association, the American Waterworks Association, and the department of preventive medicine and public health of the University of Minnesota.

## MISSOURI

**Personal.**—Dr. John I. Tucker, St. Joseph, has been appointed a member of the city council.——Dr. Nathaniel Allison, St. Louis, sailed from Europe, October 3, on the *Majestic* for New York.——Miss Geraldine Lermit has been appointed director of the Missouri Association of Occupational Therapy.——Dr. David H. Dolley, formerly pathologist at the University of Missouri, Columbia, has been appointed head of the department of pathology at St. Louis University School of Medicine.

**Annual Clinic Week.**—Under the auspices of the Kansas City Academy of Medicine, of which Dr. George E. Bellows is president, clinics for visiting physicians were held at all Class A hospitals in Kansas City, during the Priests of Pallas week, October 4-7. These clinics will now be held every Priests of Pallas week, it is announced, and also during the American Legion Convention. Dr. Dean Lewis of Rush Medical School, Chicago, spoke on "Diagnosis of Bone Lesions."

**Swedish Otologist Gives Lecture Courses.**—Dr. Robert Bárány, professor of otology of the University of Upsala, Sweden, and winner of the Nobel prize in medicine in 1914, gave a two weeks' lecture course and several clinics for eye specialists and neurologists in St. Louis, October 9-21. Dr. Bárány was the guest of honor of the American Academy of Ophthalmology and Otology, which held its annual meeting in Minneapolis, last month. Dr. Bárány will give a similar course of lectures in Chicago, Denver, Los Angeles, Houston, Cincinnati, Cleveland, Boston and New York.

**Get-Together Dinner.**—The members of the St. Louis Medical Society will gather at the Elks' Club on the evening of Armistice Day for a get-together dinner. The principal object of the occasion is the celebration of the purchase of a plot of ground on which to erect a new fireproof building for the society and its library, and to discuss methods for raising $200,000 for the construction of the new home. The ground cost $22,500, and this sum was donated by forty-five members, each of whom contributed $500. Dr. John A. Witherspoon of Nashville, Tenn., a former president of the American Medical Association, will be the guest of honor and will use his well known oratorical and anecdotal talents for the success of the project.

## MONTANA

**Montana State Hospital.**—Dr. Robert E. Hathaway, Glendive, a veteran of the World War, has been appointed by the governor to succeed Dr. Scanland as superintendent of the Montana State Hospital for the Insane, Warm Springs. He was formerly president of the Medical Association of Montana.——Dr. Harris A. Bolton, assistant superintendent to Dr. Scanland, has resigned. Both Dr. Bolton and Dr. Scanland went to Montana from the Mercy Hospital, Baltimore.

**New School for Ex-Service Men.**—The U. S. Veterans' Bureau, District No. 10, has opened an exclusive trade school at Helena for the rehabilitation of World War veterans. It is a four-story building with modern equipment and is purposed to supplant placement training of trades to a large extent by this more desirable type of practical institutional training. A curriculum of trades, such as auto mechanics, electricity and machine shop work, will be taught by twelve high grade instructors. The Helena office of the bureau has moved into the building and will occupy one floor.

## NEW JERSEY

**Hospital Items.**—Dr. Carl E. Stephen, Newark, has resigned as superintendent of the Newark City Hospital.——Dr. Martin I. Marshak, superintendent of the Sanatorium of the Jewish Consumptives' Relief Society, Edgewater, Colo., has resumed private practice in Bayonne.——An addition will be erected at the Paterson General Hospital at a cost of $400,000.——A new children's ward is under construction at the Cooper Hospital, Camden, which will increase the capacity of the hospital to 200 beds.——Plans have been completed for the $300,000 addition to the Newark City Hospital.——Bids were let, November 1, for the new hospital building to be erected for the Irvington General Hospital.

## NEW MEXICO

**Personal.**—Dr. Frank E. Mera, Sunmount Sanatorium, Santa Fe, has been appointed a member of the board of public welfare to succeed Dr. LeRoy S. Peters, who resigned recently to devote his time to St. Joseph's Sanatorium.

**Health Department Organized.**—It is announced by the New Mexico State Bureau of Public Health that, after Jan. 1, 1923, Dona Ana County will have a full-time health department with a full-time health officer in charge.

## NEW YORK

**Physicians Decorated.**—Dr. John B. Walker, colonel, M.R.C., New York, was the recipient, October 19, at the office of Major-General Bullard, Governors Island, of the Distinguished Service Medal, for exceptionally meritorious and distinguished service as commanding officer of Base Hospital No. 116, A. E. F., in France, and for his work in rehabilitation of the disabled.——Dr. Francis E. Fronczak, health commissioner of Buffalo, was recently presented with the order of "Polonia Restituta," by the consul for the Republic of Poland in that city. The medal was conferred on Dr. Fronczak by special decree of General Pilsudski, president of the Republic of Poland, for services rendered by him to the Polish army in France and Poland.

### New York City

**A Metabolic Clinic.**—The Post-Graduate Hospital has established a metabolic clinic with a full force of specialists. It will deal with nephritis, hypertension and glycosuria, and their sequels. Evening as well as day service is included.

**Smallpox Halts Liner.**—The liner *Maracaibo*, which arrived in this port, October 24, was detained at quarantine indefinitely because of the illness with smallpox of a negro dining room steward. All the nonimmune passengers were compelled to remain on board and to be vaccinated.

**New Physicians' Building.**—The new building, exclusively for physicians and surgeons, on East Fifty-Third Street, is now ready for occupancy. The building is seven stories high, with four complete suites on each floor. There will be a trained staff of attendants on each floor at the service of the physicians.

**Public Health Lectures.**—A course of lectures on health education and prevention of disease is announced, under the auspices of the Public Health Education Committee of the Medical Society of the County of New York, in cooperation with the New York Academy of Medicine. These lectures will be presented at the New York Academy of Medicine, as follows: November 8, "The Care of the New-Born Child," by Dr. Frederic W. Rice; November 13, "Care of the Health of New York City Children by the Department of Health," by Dr. J. L. Blumenthal; November 22, "Mental Hygiene Problems of Childhood and Adolescence," by Dr. Frankwood E. Williams; December 6, "Health Education for Children," by Dr. Frances Cohen; December 11, "Exercise in Normal and Abnormal Children," by William St. Lawrence, and "Good Posture, a Health Asset for Children," by Harriet Wilde.

**Personal.**—Dr. Robert Rosenberg and Dr. Julius Ferber, New York, sailed, October 3, for Hamburg.——Dr. Frederick E. Sondern, president of the New York Post-Graduate Medical School and Hospital, arrived on the *Cedric*, October 2, from Liverpool.——Dr. Esther Lovejoy, president of the American Women's Hospital Association, was recently attacked by a Turk while aiding refugees in Smyrna. She was struck on the head with the butt of his rifle, but was rescued finally by an American officer.——Dr. Richard Derby, New York and Oyster Bay, sailed for Europe on the *President Roosevelt*, October 14.——Dr. Francis B. Jennings and Dr. Herman Baruch, New York City, sailed on the *Chicago* for Havre, October 5.——Dr. Anthony Bassler has been appointed consulting gastro-enterologist to St. Vincent's and the Jewish Memorial hospitals, New York City, and gastro-enterologist to the Fifth Avenue Hospital.——Dr. H. J. Hamburger, professor of physiology at the University of Groningen, Holland, will deliver the first Harvey Society Lecture at the New York Academy of Medicine, November 3. His subject will be "The Increasing Significance of Chemistry in Medical Thought and Practice."——A complimentary dinner was given to Dr. Charles Gordon Heyd, October 21, by members of the surgical staff of the New York Post-Graduate Medical School and Hospital.——The Austrian government has conferred the honor decoration of the Red Cross, with laurel wreath, on Dr. Emanuel DeMarnay Baruch, New York City, in recognition of his services in connection with Austrian relief work.——Drs. Frederick H. Albee, John A. Fordyce and John E. Stillwell, recently returned from Europe.——Dr. Arley Munson has been decorated by the French government in recognition of her services in establishing a laboratory and directing a hospital in France, under the auspices of the Rockefeller Foundation.

## NORTH CAROLINA

**Tuberculosis Conference.**—The second annual conference of the North Carolina Tuberculosis Association was held in Goldsboro, October 3-4. Dr. Allen K. Krause, Baltimore, represented the national association. Dr. J. Howell Way, president of the state board of health, and Dr. Watson S. Rankin, secretary of the board, presided at the afternoon and morning sessions, respectively.

## OHIO

**Health Commissioners Convene.**—The Northwestern Ohio Health Commissioners' conference was held in Lima, November 2. Twenty-six counties in the northwest section of the state are included in the district and all sent representatives to the meeting.

**Hospital News.**—The Union Hospital, Dover, has recently opened a thirty-bed addition and twelve beds have been added to the old section.——The Union Hospital Association have sold the old Eddy Road Hospital and grounds, Cleveland. The institution will be remodeled and again used as a hospital, it is stated.——The state board of control has granted the request of the state welfare department for $175,000 for a new building for the accommodation of incurable patients of the Cleveland State Hospital.

## OREGON

**Hospital News.**—A proposal from governmental officials to buy the Hahnemann Hospital, Portland, for conversion into a hospital for the care of tuberculous ex-service men, has met with approval from the city council, it is announced. Revocation of the ordinance prohibiting the retention of tuberculous patients within the city limits will be agreed to by the council, provided the government agrees to care for ex-service men only. This will eliminate the necessity of sending patients to Walla Walla, Wash., the nearest government hospital.——The new four-story wing at St. Anthony's Hospital, Pendleton, will be opened to the public this month. The new addition will care for fifty more patients and was erected at a cost of $250,000, including equipment.

## PENNSYLVANIA

**Society News.**—The members of the Mercer County Medical Society held their annual banquet, October 26, at Sharon. Dr. Carl A. Hamann, dean of the Western Reserve University, School of Medicine, Cleveland, gave an address on "Surgery of the Rectum." Dr. Walter F. Donaldson, secretary of the Medical Society of the State of Pennsylvania, and Dr. Thomas E. Jones of the Cleveland Clinic, also gave addresses.——The New England Pediatric Society, the Pediatric Section of the New York Academy of Medicine and the Philadelphia Pediatric Society held a joint meeting in Philadelphia, November 4. A banquet was given in the evening.——The nineteenth annual meeting of the Eighteenth Censorial District, including Snyder, Northumberland, Montour and Columbia counties, was held, September 8. The meeting was called to order in the court house at Bloomsburg. The address of welcome was delivered by Dr. Frank R. Clark, president of the Columbia County Medical Society. The following officers were elected for the ensuing year: president, Dr. Percival Herman, Selinsgrove, and secretary, Dr. Luther B. Kline, Catawissa.——More than 200 surgeons met in Philadelphia, October 20-21, for a convention of the Association of Surgeons of the Pennsylvania Railroad System, held under the presidency of Dr. Joseph D. McCann, Monticello, Ind. Dr. John B. Deaver, Philadelphia, gave an address on "Pitfalls in the Diagnosis of Chronic Diseases of the Upper Abdomen."——The Roentgen Ray Society of Central Pennsylvania and the Fayette County Medical Society held a joint meeting, October 14, at Uniontown. Following the banquet, the county medical society showed the Wertheim obstetric film of 5,000 feet, and a film dealing with venereal disease.——At a meeting of physicians of Greensburg, October 18, the Greensburg Academy of Medicine was formed, with Dr. John J. Singer, president, and Dr. Charles C. Crouse, secretary-treasurer.

### Philadelphia

**Clinic for Defects of Speech.**—This clinic, formerly conducted at the Medico-Chirurgical Hospital, was transferred to the Children's Hospital, October 17. The dates and hours will be the same.

**Home for General Wood.**—Anticipating the coming of Gen. Leonard Wood to the University of Pennsylvania, next January, the board of trustees made provision to complete alterations in the provost's home, 4037 Pine Street. The house was made possible by a fund subscribed by the alumni in 1916.

**Alvarenga Prize.**—The College of Physicians of Philadelphia announces that the next award of the Alvarenga prize, being the income for one year of the bequest of the late Señor Alvarenga, amounting to $300, will be made, July 14, 1923. Essays intended for competition may be on any subject in medicine, but must not have been published. If written in a language other than English, an English translation should accompany them. All essays must be in the hand of the secretary, John Girvin, 19 South Twenty-Second Street, Philadelphia, before May 1, 1923.

**Personal.**—Dr. Samuel W. Hamilton, medical director of the Philadelphia Hospital for Mental Diseases, resigned, October 6. It is understood that Dr. Hamilton will return to his former work as assistant medical director of the National Committee for Mental Hygiene of New York.——Dr. Edgar Fahs Smith, president of the American Chemical Society and head of the department of chemistry at the University of Pennsylvania, spoke on "The Early History of Organic Chemistry in America" at the Medical College of Virginia, Richmond, October 13.——Dr. John Marshall, former dean of the medical school of the University of Pennsylvania and professor of toxicology, has been appointed emeritus professor of chemistry and toxicology by the board of trustees of the university. Dr. Marshall retired last June because he had reached the age limit set by the board.——Dr. Charles J. Hatfield has been reelected chairman of the Southeastern Pennsylvania Chapter of the American Red Cross.

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## SOUTH CAROLINA

**Chiropractor Sentenced.**—A newspaper report states that R. Lyman Love, chiropractor of Charleston, was found guilty, October 4, of practicing medicine without a license. The jury recommended mercy, and the judge imposed a sentence of ninety days' imprisonment or a fine of $300. Love was formerly convicted on a similar charge.

## SOUTH DAKOTA

**New Medical Society.**—At a meeting of physicians and dentists from Salem, Spencer, Canistota, Montrose and Bridgewater, held in Salem, October 17, the McCook County Medical and Dental Society was formed. Dr. LeRoy E. Angel, Montrose, was elected president. Dr. Andrew H. Hoyne, Salem, vice president, and Dr. Fauser, Salem, secretary-treasurer.

## TENNESSEE

**Society to Honor Hero Members.**—A committee has been appointed by the Shelby County Medical Society to arrange for the erection of a suitable memorial to those members of the society from Memphis who lost their lives in the World War. The park commissioners will be petitioned for permission to erect a tablet in Confederate Park.

## TEXAS

**Hospital News.**—The contract has been let and work will be started in the near future for the addition of a $12,000 building for the Victoria Hospital.——Drs. J. S. Yates and J. W. Weeks, recently consummated negotiations for opening a modern public hospital in Rosenberg. A large residence has been leased which will contain patients' rooms, quarters for nurses and for servants, and kitchens. The institution will be known as the Rosenberg Hospital.——The contract has been let for the construction work on the Soldiers' and Sailors' Memorial Hospital at San Marcos.

## VIRGINIA

**New Health Board Members.**—The state health commissioner has appointed the following physicians members of the board of health: Dr. Sidney J. Tabor, Craddock; Dr. Josiah Leake, Churchland, and Dr. Camilus F. Eason, Hickory, Drs. Tabor and Eason succeed Dr. Archibald M. Burfoot, Fentress Station, and Dr. Albert G. Horton, Ocean View. Dr. Leake is an incumbent. The budget for the board of health for Norfolk County has been cut from $25,000 to $15,000 for the year.

## WASHINGTON

**New Hospital Dedicated.**—St. Anthony's Hospital, Wenatchee, was formally dedicated, October 8. The institution is operated by the Sisters of St. Joseph, who formerly had charge of the now abandoned Wenatchee General Hospital. The building now opened is the first of three units that will be constructed on the site.

## WISCONSIN

**Tuberculosis Conference Elects.**—At the Mississippi Valley Tuberculosis Conference in Milwaukee, T. G. Paterson, Columbus, Ohio, was elected president, and Mrs. Saches, Chicago, vice president. The next meeting will be held in Evansville.

## CANADA

**Extension Lectures by Ontario Medical Association.**—The committee on education of the Ontario Medical Association will issue a new graduate schedule covering the extension lectures to be offered by the association in the near future. It is announced that, through the cooperation of the medical colleges and the medical profession, the program will be complete and comprehensive.

**British Columbia Medical Association.**—At the recent annual meeting of the association in Vancouver, the following officers were elected: president, Dr. Richard Eden Walker, New Westminster; president-elect, Dr. George A. B. Hall, Victoria; vice president, Dr. William O. Rose, Nelson, and secretary-treasurer, Dr. William A. Clarke, Vancouver. Dr. Alexander S. Monro, Vancouver, presided at the session.

**Personal.**—Dr. William J. Bell, Toronto, pediatrician to the Ontario Board of Health, read a paper before the annual convention of the National Child Hygiene Association at Washington, recently.——Dr. Robert Wightman, Vancouver, has resigned as school medical officer.——Dr. Edward R. Secord, president of the Ontario Medical Association, and Dr. Thomas C. Routley, secretary, gave addresses at a special session of District Number Four of the provincial association, at Niagara Falls, recently.

**The Congress of French-Speaking Physicians.**—The *Union médicale du Canada* reproduces some of the addresses at the Seventh Congress of French-Speaking Physicians of North America, held at Montreal, Sept. 7-9, 1922, with an attendance of 400. This association grouping the French-speaking physicians was founded by Dr. Brochu. The leading addresses had been printed, and were distributed at the opening of the meeting. A feature of the congress was the tribute to Pasteur in commemoration of his centennial in December, Dr. L. Parizeau delivering the address at the opening meeting. It was suggested that French-speaking physicians in Europe should be eligible to membership. The meeting was the first since the war, and the Paris university, the Académie de médecine, and the Société médicale des Hôpitaux de Paris sent Professor Achard at the head of a delegation comprising Professors Ombrédanne and Desmarest and Drs. Gastou, Pinard and Guinez. The *Bulletin* of the Académie de médecine published recently Achard's report on his mission. The success of the congress is due in large part to the president, Dr. Dubé, and the secretary, Dr. St.-Pierre. They had provided ample facilities for practical demonstrations in the hospitals, an innovation at these meetings.

## PHILIPPINE ISLANDS

**Philippine Government Refuses to Send Medical Delegates.**—*The Journal of the Philippine Islands Medical Association* states that, although the government did not consider it excessive to defray the expenses of nearly 150 athletes representing the Philippines in the Olympiad that took place in Shanghai, China, it decided that the government funds would not permit of the expense of sending the five medical representatives of the islands (already appointed) to the International Congress of Tropical Medicine, held at Weltevreden, Java, in August. The cost of transportation for the five representatives would only have been 5,000 pesos ($2,500).

## GENERAL

**Warning.**—Dr. J. R. Sprague of Athens, Ohio, warns against a man about 60 years old, with fistula, who entered the hospital in that city, and disappeared after passing a worthless check. A similar procedure was undertaken by the same man at Piqua, Ohio. If he is apprehended, it is requested that the prosecuting attorney, Athens, Ohio, be notified.

**Vaccination Ordinances Assailed in Court.**—The validity of municipal ordinances under which boards of health are authorized to enforce vaccination against smallpox and to take other precautions to prevent epidemics was assailed in the Supreme Court, Washington, October 20, in a case brought by Rosalyn Zucht against officials of San Antonio, Texas.

**National Tuberculosis Association's Film.**—A 160-foot motion picture entitled "Matty Wins His Greatest Game" will be released by the National Tuberculosis Association in connection with the Christmas seal sale. The trailer shows the hero in the days when he was the greatest pitcher; the announcement of his illness follows; and the film concludes with pictures of "Matty" after his recovery from tuberculosis.

**Lasker Memorial Fund.**—The proceeds of the fund, given to the American Society for the Control of Cancer by the family of Mrs. Lasker in memory of her son, will be used this year in the publication of a series of fourteen lithographed posters. They will be distributed to each of the society's 700 committees for exhibit, especially during Cancer Week. They call attention to the need of early diagnosis and treatment of cancer.

**Dermatological Research Laboratories Discontinue Manufacture of Arsphenamines.**—The Dermatological Research Laboratories, Philadelphia, announces that it will discontinue the manufacture of arsphenamines and neo-arsphenamin and that all the interests of this organization have been transferred to the Abbott Laboratories, Chicago. Dr. George W. Raiziss will continue to direct the production of these drugs. The funds resulting from the sale will be used to further research in the Dermatological Research Institute, Philadelphia.

**American College of Surgeons.**—The annual congress of the American College of Surgeons was held in Boston recently. More than 2000 surgeons, including those from South America and Europe, attended the sessions. Dr. Raffaele Bastianelli, Rome, delivered the John B. Murphy oration in surgery. Dr. Francis Seymour Kidd, London, England; Dr. Andrew Fullerton, Belfast, Ireland, and Dr. Einar Key, Stockholm, were among the foreign visitors. Dr. Albert J. Ochsner, Chicago, was elected president, and Dr. Franklin H. Martin, Chicago, was appointed director general.

**Women Oppose Antivivisection Bill.**—At the annual convention of the Colorado Federation of Women's Clubs, the following resolution was passed:

Whereas, It is impossible to estimate the number of persons alive today who owe their existence to the application of methods, preventive or remedial, made possible through scientific experimentation on animals; be it

*Resolved*, That the Colorado Federation of Women's Club, in gratitude to medical science for past discoveries, beneficial both to humanity and to animals, go on record as favoring the continuance of medical research through animal experimentation.

At the regular meeting of the Colorado League of Women Voters, a resolution was passed in which they declared themselves opposed to the passage of the proposed Antivivisection bill.

**Dr. W. W. Keen Receives Bigelow Medal.**—October 25, Dr. W. W. Keen received from the Boston Surgical Society the second Henry Jacob Bigelow medal. The first medal was awarded to Dr. William J. Mayo, and a picture of the medal was published in THE JOURNAL, in connection with his address. In the address delivered by Dr. Keen, he recapitulated his hospital experience since the sixties, and enumerated the great advances made in medicine during the nineteenth century. The three chief advances made in medicine, said Dr. Keen, were vaccination, in 1796, anesthesia, in 1846, and bacteriology, including the special work of Pasteur and Lister. Dr. Keen contrasted the surgery of 1800 with the magnificent operations of today.

**Weekly Health Index.**—The Department of Commerce is publishing each week the census mortality reports from the largest cities of the United States. The total number of deaths reported (excluding stillbirths), the death rate, the number of deaths under 1 year of age, and the infant mortality rate based on deaths under 1 year for the week and estimated births for the previous calendar year, are given. Data for the corresponding week of the previous year and the infant mortality rate for 1920, for comparison, are also given for each city. These totals permit valuable comparisons, and serve as a health index for health officers and others. For the week ending October 7, telegraphic reports from sixty-two cities, with a total population of 27,000,000, indicate a mortality rate of 11.1 as against 10.6 for the corresponding week of last year. The highest rate appears for Nashville, Tenn. (22.5), and the lowest for Akron, O. (5.3). The highest infant mortality rate appears for Cambridge, Mass. (164), and the lowest for Worcester, Mass., which reported no infant mortality. As weekly figures always fluctuate widely, caution should be used in their interpretation.

**Bequests and Donations.**—The following bequests and donations have recently been announced:

St. Louis Children's Hospital, for the erection of an addition, $326,000, by public subscriptions.

Asbury Hospital, Minneapolis, $300,000, by an anonymous donor.

Roper Hospital, Charleston, S. C., $100,000, by the will of Mrs. Mary Ross of Charleston.

Chicago Children's Benefit League, $93,000, the result of a tag day.

Flushing Hospital, Long Island, N. Y., $25,000, and the Sailor's Snug Harbor, Staten Island, $50,000, by the will of Miss Angie Booth.

Pikesville, Ky., the new hospital building, $50,000, by local coal corporations.

Free Hospital for Poor Consumptives, White Haven, Pa., and the White Haven Sanatorium Association, each $5,000; Children's Seashore House, Atlantic City, N. J.; the Kensington Dispensary for the Treatment of Tuberculosis, and the Starr Center Asociation, Philadelphia, each $3,000, by the will of Henry Freund.

Methodist Episcopal Hospital, Philadelphia, $2,500, by the will of Anne Norris.

St. Anthony's Hospital, Pendleton, Ore., $1,000, from the Catholic Women's Guild.

Hand Hospital, Shenandoah, Iowa, for upkeep, $500, by the physicians of the city.

Children's Memorial Hospital, Chicago, following personal bequests, one third of the residue of the estate of the late Edward Archibald Valentine, Chicago.

State Charities Aid Association, $500, from Mrs. Higgins of Olean, N. Y., and $100, from Mrs. George Baker of New York.

Suffolk County Tuberculosis Sanatorium, Holtsville, N. Y., a new schoolhouse for the children of the sanatorium, by the citizens of Suffolk County, through the Suffolk County Tuberculosis Committee.

Waynesboro (Pa.) Hospital, the new operating room with modern equipment, by D. Byers, Ira N. Byers and R. J. D. Byers, in memory of their parents.

## LATIN AMERICA

**Mexican Academy of Medicine.**—In his annual report for the year 1921-1922, the outgoing president, Dr. Nicolas León, reviews the work accomplished by the Academy of Medicine of Mexico during the year. The academy was recently compelled to vacate its quarters at the medical school and is now lodged at the office of the public health department. The lack of funds has prevented the publication of the official journal, *Gaceta Médica de México*. Members of the academy are at present paying as monthly dues from 5 to 10 pesos ($2.50 to $5).

## FOREIGN

**Term "Shell Shock" Will Not Be Recognized.**—It is reported that the British government has decided to drop from all official literature the term "shell shock."

**Stamps Will Bear Portrait of Pasteur.**—In compliance with the Madrid Postal Convention, France will issue a new 50 centime stamp. It is proposed that the stamp shall bear the portrait of Louis Pasteur, in honor of his centenary.

**Use of Hydrocyanic Acid Forbidden in Germany.**—The *Deutsche medizinische Wochenschrift* states that a recent decree forbids use of hydrocyanic acid or any of its esters, or volatile preparations of it, for any purpose whatever.

**Health Officers' Annual Banquet.**—The annual dinner of the Medical Officers of Health was held in London, October 20. Sir Alfred Mond, Sir Arthur Robinson, Sir George Newman and Sir Humphry Rolleston were among those present.

**New Building at University Opened.**—The new building for the Institute of Pathology of the University of Freiburg was formally opened in September. Dr. Ludwig Aschoff, professor of pathology at the university, gave the inaugural address.

**Museum of Pharmacy.**—The University of Lausanne has bought the Reber historical pharmacutic collection for its museum, which is to be inaugurated next year at the celebration of the semicentennial of the university.

**French Mother Decorated.**—The minister of agriculture of France decorated a woman farmer at Moulins, France, October 22, with the order of agricultural merit, as an example for all French women to follow. The woman is the mother of fifteen children, fourteen of whom are working on the land.

**Donation from Ireland to Austria.**—Following the visit to Dublin of Professor Frankl of Vienna, the Royal Academy of Medicine of Ireland recently made a collection among its members for the aid of the medical library of the Medical Society of Vienna. Nearly $250 was collected, which at the present rate of exchange was of real assistance.

**Rollier Course of Lectures.**—Another free course of lectures and clinical demonstrations on heliotherapy will be given at Leysin, January 16-21, 1923, by Dr. Rollier and his collaborators. Inscriptions will be received until December 20. For program and other particulars, apply to the secrétariat medical du Dr. Rollier, "Les Frenes," Leysin, Switzerland.

**The Mendel Centennial.**—The celebration at Brünn of the centennial of Gregor Mendel turned out to be an imposing international tribute to the pioneer research worker, with numerous representatives of different countries, America, England, Switzerland and Japan. The main address was delivered by Professor Brauer, director of the Berlin Institute for Research on Heredity.

**New Russian Periodical.**—The first number of *Meditzinskaia Bibliographia*, a new medical magazine published by the Narkomsdrav of the Soviet government in Moscow, has recently appeared. Narkomsdrav is an abbreviation of National Commission for Preservation of the Public Health. The periodical employs the new form of spelling of the Russian language. The editors are Drs. I. A. Bagashef, E. I. Kvater and N. G. Freiberg.

**Professional Congress of Hospital Medical Forces.**—The Third Congress of the Association professionelle of the physicians, surgeons and specialists of the civilian hospitals of France was held at Paris early in October, Prof. H. Reynes of Marseilles presiding. The association now has 400 members and its official journal, *Hôpitaux de France*, has a comparatively large foreign subscription list. Among the subjects discussed were professional risks, and abuse of charity hospital service by those able to pay.

**Memorials to Physicians.**—A tablet with bas-relief to commemorate Dr. Magnan has been placed at the entrance of

the Sainte-Anne Asylum, formerly in his charge.——The physicians of Forlì, the birthplace of Morgagni, have opened a subscription to aid in transferring the statute of the great anatomist to the grounds of the hospital.——At the annual meeting of the German Society for Repression of the Spread of Venereal Diseases, held at Berlin in October, a special ceremonial service was arranged in memory of Prof. A. Blaschko.

**Fukien Medical Missionary Association.**—At the recent annual meeting of the association at Kuliang, China, papers were read by Drs. J. Laidlaw Maxwell, H. D. Matthews and Ronald R. Walker. The serious loss that medical work in the province has sustained during the last few years by the death, retirement or transfer to other places of eleven physicians was discussed, and the secretary was instructed to write to the secretaries of the home boards, pointing out the depletion of staff and the impossibility of maintaining efficiency of the work.

**Personal.**—Dr. James H. Martin has been appointed professor of midwifery and diseases of women in the Anderson College of Medicine, Scotland.——Dr. A. L. McGregor of the Johannesburg Hospital, South Africa, has been appointed professor of anatomy at the Medical School of Witwatersrand University to succeed Dr. E. P. Stibbe, who resigned recently.——The Swedish Society of Physicians at their recent meeting in Stockholm awarded the Anders Retzius medal to Sir Charles S. Sherrington of the University of Oxford for his researches in physiology and on the nervous system.——A gold medal was presented to Prof. Domenico Barduzzi by his students on the occasion of his retirement from the chair of skin diseases and syphilis at the University of Siena, and his fiftieth anniversary in the profession. A history of his career was also published and presented to him.

**Students Appeal for Help.**—The Ukrainian students and the representatives of all Ukrainian associations in the world assembled at a congress at Prague recently, and it was decided to send an appeal, in the form of a letter, requesting all students of civilized countries, heads of high schools, scientific societies, friends of public education, universities, academies, institutes, colleges and student associations to take, if possible, a few Ukrainian students under their care to enable them to study during the next school term, or to send money, books or old clothes. The invasion of the Bolsheviks into the Ukraine, and the consequent famine, forced the professors and students to earn their living as workmen. Lack of books, technical instruments and even ordinary school requisites renders all teaching impossible, the letter states. Any gifts should be sent to the National Association of Ukrainian Students, Praha, Hlavni Posta, prihradka 411, Czechoslovakia.

**Personal.**—The *Gazette des hôpitaux* gives the details of the reception of Prof. A. de Castro of Rio de Janeiro at the hall of the Faculté de médecine at Paris, where—as already mentioned—he delivered an address on "Glandular Dystrophias."——Prof. V. Benzon of Copenhagen has been decorated as commander of the Italian Order of St. Maurizio and as officer of the Netherlands Orange-Nassau Order.——Dr. N. D'Ancona of Padua has been made an officer of the French Légion d'honneur.——The Bavarian Academy of Sciences has elected as corresponding members, Dr. Tigerstedt, professor emeritus of physiology at Helsingfors, and Dr. Ramón y Cajal, professor emeritus of histology at Madrid.——A committee has been formed to organize a tribute to Professor and Senator Pio Foà on his retirement from the chair of pathologic anatomy at the University of Turin. He reaches the age limit next year. The secretary of the committee is Prof. C. Gamna, via Pietro Giuria 15, Turin.——A Cajal prize is offered this year by the Academia de Medicina y Cirugia at Barcelona, as part of the tribute to Prof. Ramón y Cajal. The prize, 1,000 pesetas, will be awarded for the best work describing original research on any histologic topic, accompanied with slides, photomicrographs, etc.——The organized physicians of Finland recently elected Prof. F. Martius of Rostock to honorary membership.——Dr. A. Loewy, professor of physiology at Berlin has accepted the charge of the institute for study of the physiology of altitudes recently founded at Davos by the Swiss government.——Laval University conferred an honorary degree on Professor Achard on his recent visit to Canada.

### Deaths in Other Countries

Dr. **Alexander Maclean** of the Glasgow Health Department, from pneumonia.——Dr. **Anne Fenton Cleaver,** assistant medical inspector of schools for the Transvaal, South Africa, September 24, from influenza.——Dr. **J. H. Goodliffe,** formerly medical officer of the Uganda Protectorate; at Kingston, Jamaica.——Dr. **J. S. Tew,** health officer; at one time assistant demonstrator of anatomy at Durham College of Medicine, England; also a barrister, September 27.——Dr. **Armand Bernard,** lecturer on venereal diseases at the Liverpool University, England, October 4, aged 77.——Surg.-Gen. **W. C. Roe,** October 8, at Bournemouth, England.——Dr. **Thomas C. Railton,** at Buxton, England, aged 78.——Dr. **T. D. Luke,** formerly lecturer in anesthetics at the University of Edinburgh; author of a "Manual of Physio-Therapeutics," aged 49.——Dr. **F. T. Trouton,** emeritus professor of physics in the University of London, September 21, aged 58.——Lieut.-Col. **William Price,** brigade surgeon, former principal and professor of medicine, Madras Medical College, Coonoor, India, August 26, aged 76, from heart disease.——Dr. **Alan Kidd,** superintendent of the Colombo General Hospital, Ceylon, recently, from neurasthenia.——Dr. **Paul-Henri Lucas-Championnière** of Paris, whose medical degree dates from 1906, was killed recently in an automobile accident.——Dr. **T. Severin J. Nordentoft,** one of the pioneers of roentgenology in Denmark, aged 56. The *Ugeskrift for Læger* mentions that he died a victim to the science he worshiped.——Dr. **E. Dupont,** an eminent army medical officer in Belgium, aged 57.——Dr. **du Cazal** of Clermont-Ferrand, France.——Dr. **H. Schönheimer** of Berlin, a worker in the interests of the organized profession.——Dr. **K. Beerwald** of Berlin, founder of the German League for Public Hygiene, aged 64.

### CORRECTION

**Appointments at Ohio State University.**—In regard to the item published in THE JOURNAL, October 21, announcing appointments to the faculty, Dean McCampbell writes that the names of H. W. Hughes and H. E. Lowery should have been omitted as they are technicians.

## *Government Services*

### Honor for General Wolfe

Brig.-Gen. Samuel H. Wolfe, reserve officer, U. S. Army, New York, was recently awarded a distinguished service cross by Secretary of War Weeks, for having instituted measures for the protection of soldiers during the World War that ultimately resulted in the establishment of the War Risk Insurance Act.

### New Clinic for Psychotic Patients

A new clinic has been opened by the U. S. Veterans' Bureau at Huntington, W. Va., under the direct supervision of Dr. L. V. Guthrie, superintendent of the Huntington State Hospital. The building is entirely separate from the state hospital and is used exclusively for ex-service men, claimants of the bureau. It is equipped with all modern apparatus for the care and treatment of the different forms of psychosis and is identical with the clinics at Marion, Va., and at Catonsville, Md.

### A New Aeroplane Ambulance

At the next international Red Cross convention, to be held eighteen months hence, the immunity from attack of the newly adopted airplane ambulance will be considered. It is desired to extend to this ambulance the agreement and rules that apply to certain specified objects, institutions and personnel connected with the medical service in time of war. It is proposed to have the United States represented at the convention by an officer of the medical corps of the army, one of the Navy Medical Corps, one of the U. S. Public Service, a member of the American Red Cross and a representative of the American Medical Association. The argument in favor of including the airplane ambulance and its personnel in the list of those exempt from attack in war is based on the fact that it is a means of the army medical department for the transportation of the sick and wounded. All personnel operating and pertaining to airplane ambulances is such as would enjoy the immunity under the present Red Cross convention in the performance of their duties as part of the sanitary service. The machine carries a pilot and medical officer. No personnel trained as observers or

capable of making aerial observations is carried in the machine. No instruments or apparatus used in observation are included in its equipment. The airplane ambulance has a distinctive marking, being painted white with maroon trimmings, bearing the Red Cross on the fusillade and wings, and the caduceus (the symbol of the medical department) on the tail.

### Research Division for Chemical Warfare Service

A medical research division of the chemical warfare service is to be established at Edgewood Arsenal, Maryland. This step has been taken on recommendation of Col. H. L. Gilchrist, M. C., U. S. Army, and with the endorsement of Brig.-Gen. Amos A. Fries, chief of the chemical warfare service. Lieut.-Col. E. B. Veder, M. C., U. S. Army, has already been placed in charge of the new division, and to it will be attached a toxicologic department under First Lieut. H. A. Kuhn of the chemical warfare service. The purpose of the new organization is to conduct important investigations into the pathologic results produced by toxic gases, with the developments of methods of treatment of gas poisoning in human beings. Treatment of gas cases is entirely different from that of other wounds produced by implements of war, and in this connection it is proposed to conduct a school for instruction of medical officers. It also is planned to investigate certain specially developed serums that may be used as a protection against gas attack, after the manner of the antityphoid inoculation for prevention of that disease and vaccination as a protection against smallpox. By this means it is hoped to discover some form of serum that will reduce the suffering caused by gases in battle. No school in this country furnishes this sort of instruction, and the institution at Edgewood Arsenal will provide training and education on these subjects of inquiry. The work already performed by the medical division of the chemical warfare service has been of great importance, particularly in ascertaining the after-effects of gas. A more widely effective prospect is the result of an investigation that may prove that certain kinds of gases, notably that known as "mustard," is efficacious in the treatment of respiratory diseases, including tuberculosis.

### Dr. McDill Appointed General Medical Consultant

The office of medical adviser has been abolished by the U. S. Veterans' Bureau, and the position of general medical consultant has been established in its place. Dr. John R. McDill, Washington, D. C., has been appointed to the position.

### Dr. Sawyer to Retain Position

President Harding has announced that he is satisfied with the service of Brig.-Gen. Charles E. Sawyer, his personal physician, and will not ask his resignation as demanded by the American Legion in its national convention held at New Orleans. It was stated also at the White House that the Federal Board of Hospitalization of which Dr. Sawyer was chairman was a voluntary creation of the President and as such the President assumed all responsibility for it. The President, it was also explained, plans to bring the hospitalization board into closer cooperation with the agencies of government having to do with the treatment of disabled former service men and by this new arrangements expects the hospitalization board to more than justify itself.

### Veterans' Bureau Graduate Medical Courses

Establishment of U. S. Veterans' Bureau schools for physicians at St. Elizabeth's Hospital, Washington, D. C., and at Oteen, N. C., was announced by Col. Charles R. Forbes, director, this week. The schools will be in operation within the next thirty days, and will give scientific instructions to physicians, working under the bureau, in the treatment of mental diseases and tuberculosis. For the school at St. Elizabeth's Hospital in Washington to be used for the instruction of psychiatrists, $200,000 has been assigned by the Veterans' Bureau as a preliminary fund, with Dr. W. A. White, head of St. Elizabeth's, to take charge and arrange the course. Physicians from the Army, Navy and the Public Health Service and from civil life working for the Veterans' Bureau in the care and treatment of disabled war veterans will be accepted for special training. The tuberculosis school at Oteen has already been started, with a special course for physicians, and it will be immediately expanded. No new buildings will be necessary, as the institution's present facilities are sufficient. The bureau, however, will finance all necessary new equipment to conduct the school, including the salaries of the teaching staff as well as the expenses of students in attendance. The psychiatric school at St. Elizabeth's will be attended by hundreds of physicians from all parts of the country, it is predicted, and its graduates will be sent to the bureau's several institutions to take personal charge of the patients and to instruct other physicians in the latest developments of this science. Expenses for the two schools, it is announced by Colonel Forbes, will come from the U. S. Veterans' Bureau general fund and not from the $17,000,000 appropriation for hospitals.

## Foreign Letters

### BELGIUM

*(From Our Regular Correspondent)*

LIÉGE, Oct. 4, 1922.

### Congress of Anatomists

At the International Congress of Anatomists held at Ghent, in the Institute of Anatomy, an imposing array of anatomists, histologists, pathologic anatomists and biologists were present. To the large contingent of French anatomists were added distinguished personages from England, the United States, Switzerland and Portugal.

The Ghent school was called on to furnish most of the papers, for it was decided at the preceding congress that at coming meetings the opportunity would be seized to familiarize the visitors at the congress with the particular institute where the association held its meetings. The papers, as a whole, reveal the fact that among anatomists there exists a happy tendency to go beyond pure description and seek to discover, under the aspects of form, the physiologic rôle, and at times even the physicochemical interpretation, of anatomic structures.

### The Academy of Medicine

Monsieur Arthus, professor of physiology at the University of Louvain, has been elected official correspondent of the Royal Academy of Medicine of Belgium. By a unanimous vote, Dr. Depage has been chosen the recipient of the quinquennial prize for the best work published in the field of medical science for the period 1916-1920. The works in question were written mainly during the war. The committee of award held that laboratory science ought to give way this time to the science of action, to the science of the field of battle, to which we are indebted for the preservation of so many lives.

### Special Graduate Courses in Tuberculosis

The national committee for combating tuberculosis has secured the collaboration of the principal tuberculosis specialists of the capital for the creation of special graduate courses, some theoretical and some practical, in the subject of tuberculosis, for the benefit of physicians who may be interested.

### Medical Care of Artists

In January, 1915, an association was formed for the purpose of assuring proper medical care to all artists, in the broad sense of the word. Since that time, the activity of the movement has manifested itself by 1,400 domiciliary visits, 1,000 hospitalizations, 3,500 treatments by specialists and the care of 15,000 patients of many different nationalities. The association has been given official recognition, and its constitution and by-laws have been published in the *Moniteur Belge*. Public donations have been numerous, testifying to the interest taken in this altruistic movement. The dispensaries give medical assistance gratuitously, without distinc-

tion as to religious or political affiliations, to lyric artists, musicians, dramatists, painters, sculptors, designers and littérateurs, and to their wives and children. In case of grave disease, operation or confinement, free hospitalization is furnished, while the remedies prescribed by the physician of their choice are also procured. Milk and eggs are provided for nursing mothers during the first months of nursing; while for weak children and those in a pretuberculous condition temporary homes in the country are found.

### Surgical Treatment of Ozena

Basing his statements on the results in twenty-six operations for ozena, Dr. van Wildenberg has called the attention of the Belgian Otorhinolaryngological Society to a new operation in which he removes the turbinate bones en masse; more particularly, the inferior and middle turbinate bones. The narrowing of the nasal cavity secured by this procedure exerts a markedly favorable influence on all atrophic states of the nasal cavities, and especially on ozena. The incision of the mucoperiosteum begins at the head of the middle turbinate, descending obliquely in front of the head of the inferior turbinate and extending to the inferior nasal floor, which it crosses transversely, passing near and parallel to the inferior margin of the pyriform orifice. The incision terminates in the septum. Then the mucoperiosteal covering of the nasal floor is detached with a rasp up to a point a little beyond the junction of the floor and the lateral wall of the nose. At this point, a gingivolabial incision is usually made. The periosteum is detached to the level of the pyriform crest. Then the inferior border of the lateral nasal wall is separated within the lateral submucous pocket of the floor. At this point, dull rasps are introduced into the vertical incision in the bone and by prying movements the antral wall is pressed up to the septum. The maxillary sinus is thus opened widely and can be easily explored.

In following this technic, van Wildenberg has observed but one accident in twenty-six cases: a phlegmon of the lower eyelid. The results of the operation were very encouraging and seem to warrant its continued application to a wide extent.

## BERLIN

*(From Our Regular Correspondent)*

Oct. 14, 1922.

### Eye Affections in Motion Picture Actors

Professor Adam of Berlin spoke recently at the ophthalmologic congress in Jena on eye affections in motion picture actors. The observed disturbances consisted of inflammatory manifestations, reddening and swelling of the lids and a more or less marked sensitiveness of the eye. Adam ascribes these disturbances to an affection of the conjunctiva. The characteristic feature of motion picture conjunctivitis is that, in addition to the inflammation, small granular nodules appear, which gives rise to the assumption that this complication is due not only to the intense light radiation, but also to the effect of the dust on the conjunctiva. The unusual amount of dust in the air in motion picture studios is due in part to the shifting of scenery and in part to the cranking of the camera. There is no doubt that this dust may be at times dangerous to health. All persons who spend much time in the dazzling brightness of such studios are liable to contract the affection. To be sure, the degree of sensitiveness and sensibility varies with the individual. Professor Adam suggested that a commission composed of technicians and ophthalmologists be appointed to test the special effect of the illumination of motion picture studios, with a view to making proposals as to how injuries to actors may be prevented. In these conditions, Adam employs what he terms *medikamentöse Wattenmassage* (massage with medicated cotton). The disturbances yield in a short time to the treatment, but recurrences are not infrequent.

### Vital Statistics of Germany for 1920

According to the statistical year-book for the German empire, the number of marriages in the years 1918, 1919 and 1920 were, in round numbers, 352,000, 844,000 and 895,000. In 1918, the total mortality exceeded the total number of births by 680,000. In 1919, however, there was an excess of births over deaths of 282,000, and in 1920, of 666,000. The total number of deaths from suicide has steadily increased during this period (1918-1920) from 10,000 to 13,000.

### Results of Body Measurements of Schoolchildren

In connection with the supplemental feeding of our schoolchildren by the American commission, the public health office of the empire has published a series of tables giving the results of body measurements of schoolchildren. Especially important are the records on the height and weight of more than 69,000 children of the *Volksschulen* (public schools of the elementary and grammar grades) of Leipzig. In the period from 1919 to 1921, an increase in the height of the children of both sexes was noted. The increase was especially noticeable for the ages 7 to 10; from then on, it was not so marked. The increase in weight was much less, proportionately, than the increase in height; it was greater in 1919-1920 than in 1920-1921. It must be borne in mind that the 10-year-olds of 1921 were from 6 to 7 years old in 1918, and that infants and children under school age stood the war and the food blockade better than did schoolchildren. According to tables from the prewar period for Germany, England, America and Sweden, as published by the American commission, the "height" figures for Swedish children are much higher, and in English and American children up to the tenth year much lower, and from then on higher than for the German children of Leipzig in 1921. The weights of foreign children are, however, almost uniformly higher, only the youngest age groups constituting exceptions. The difference in weight was often considerable, so that it becomes evident in how far the Leipzig and the German schoolchildren in general were behind the children of the other countries. If we compare the results of the Leipzig measurements with the measurements for Germany in peace times, it will be seen that the weights today are still below the weights recorded just previous to 1914. The development of the children in the postwar period had not yet become normal.

## THE NETHERLANDS

*(From Our Regular Correspondent)*

Oct. 4, 1922.

### Organization of Public Health Services

The draft of a law has been presented to the legislative chamber which tends to put all public health services under medical control. The law of 1872 in force at present puts the responsibility of combating transmissible diseases into the hands of the communal authorities, who, as a rule, accept the advice of the general practitioners, who are thus in reality the arbiters of the application of the law. A general reorganization of the whole public health system is needed. The present bill merely outlines the basis for such a reorganization. It is planned to divide the country into a certain number of sanitary districts. In each district, a public health service (*gezondheidsdienst*) will be established. The bill provides for a laboratory as well as an administrative establishment in and for each district. If it should prove impossible to create a special laboratory in each district, the public health service should at least have some definite laboratory affiliated with it. At the head of the public health service of each district will be placed a physician who is a com-

petent bacteriologist and who is thoroughly familiar with public health work. He will be aided by an assistant and also by several public health officers (physicians) in charge of the various subdivisions of the district. The public health officers in charge of these subdivisions may be merely functionaries, or they may be chosen from among the general practitioners. The district director and his assistant should, in any event, be appointed by the central government, so as to be in a position to act independently of the communal authorities (in fact, it would, according to the bill, become their duty to report any neglect of duty that came to their notice). A committee chosen from among the inhabitants of each district will serve as a connecting link between the public health authorities and the public in matters of hygiene. It is emphasized that the work of the *gezondheidsdienst* should be confined solely (or, at least, mainly) to the field of preventive medicine. The services of therapeutic medicine (hospitals, dispensaries, etc.) should be separate and distinct, under an independent director. The best system would be to establish in each district, as independent organizations but acting in collaboration: a public health service; a medical service, and a special service for the medical inspection of schools. One laboratory, in charge of the director of the public health service, would serve all three organizations alike.

### A New Publication

The first number of a new weekly dealing with the subject of the hygiene of alimentation and bearing the title *Volkswoeding* appeared recently. Its purpose is to organize a campaign against all adulterations and against the dangers that threaten general food values. This movement started with the promulgation of the act termed the *Warenwet*, a law which establishes an effectual supervision over all food products offered for sale. Dr. van Roolte is the editor-in-chief.

### Malaria in the Navy

The statistics on malaria in the navy in 1919, as recently published, have a certain degree of interest. The number of cases of malaria observed in the navy, outside the East Indies, during the year 1919 runs high—1.51 per cent. However, among Europeans sojourning in the Indies, the amount of infection has decreased quite perceptibly, dropping from 17.11 per cent. in 1918 to 12.20 per cent. in 1919, for primary cases, and from 43.16 to 25.62 per cent. for recurrences. It would seem, therefore, that the campaign that has been conducted systematically during recent years may be regarded as effective.

### National Bureau of Anthropology

A national bureau of anthropology has been created at Amsterdam. It is affiliated with the International Institute of Anthropology, the seat of which is at Paris. This organization purposes to develop these studies in the Netherlands and in all Dutch colonies, to aid in the establishment of missions to further anthropologic study, and, more particularly, to coordinate the results and the methods of research. The bureau will likewise endeavor to make known in foreign countries what the Netherlands is accomplishing in this field. With this purpose in view, it will furnish articles regularly to the *Revue anthropologique*, the organ of the international institute. The bureau will also do its utmost to improve the instruction in anthropology. Many learned societies have already been registered as constituent members of the bureau; for example, the Colonial Institute, the Geographic Society and the Encyclopedic Bureau of the Dutch East Indies. Prof. Kleiweg de Zwan has been elected president. The new society consists of the following six sections: physical anthropology and anthropologic geography, ethnography, eugenics, folklore, sociology, archeology and prehistory.

## Marriages

MATHESSON JAMES MONTGOMERY, Lieut., M. C., U. S. Navy, New York, to Miss Rosina Moorhead La Ross of McDonald, Pa., September 18.

DAVID HERBERT SMITH, Glenn Spring, S. C., to Miss Elizabeth Lurania Davis of Columbia, October 17.

ERNEST HAROLD KING to Miss Mildred Engle, both of Los Angeles, at Riverside, Calif., recently.

ELMER ROCKWOOD EDSON to Miss Marie Frances Gashweiler, both of Seattle, in September.

THOMAS JUDSON IRISH, Forest City, Iowa, to Miss Magdaline Grimm of Iowa City, recently.

CHARLES LINCOLN STODDARD to Mrs. Orlou Ballard Ross, both of San Diego, Calif., recently.

ROGER H. DUBOSE, Roanoke, Va., to Miss Lucy Ross of East Orange, N. J., October 4.

DAVID MARTIN BOYD to Miss Janet Pressly Mabon, both of Pittsburgh, September 23.

ROBERT GOODALL PACKARD to Miss Elfrida Van Meter, both of Denver, September 20.

GEORGE F. GRACEY, Harrisburg, Pa., to Miss Jean Smith of Gordon, September 23.

GLENN D. DUNMIRE to Miss Bess Botkin, both of Duquesne, Pa., September 20.

## Deaths

**William Augustus Quinn** ✠ Chicago; College of Physicians and Surgeons, Chicago, 1894; member of the Chicago Dermatological Society; professor of dermatology and syphilology at Loyola University School of Medicine, Chicago; formerly associate instructor in skin and venereal diseases at Rush Medical College; on the staffs of the St. Joseph's, Mercy, Frances Willard and St. Bernard's hospitals; died, October 17, aged 53, from myocarditis and chronic nephritis.

**George Barrie** ✠ New York; Georgetown University School of Medicine, Washington, D. C., 1892; formerly associate professor of surgery at his alma mater; member of the American Society for the Advancement of Science and the New York Academy of Medicine; surgeon to the New York City, Children's and Post-Graduate hospitals and the hospital for the Relief of Ruptured and Crippled; died suddenly, October 15, aged 57, from angina pectoris.

**John Wallace Ellis,** Elk Point, S. D.; Hahnemann Medical College and Hospital of Chicago, 1895; member of the State Medical Association of Texas; for several terms county clerk; formerly member of the school board and city council; at one time president of the state board of health; superintendent of the Union County Board of Health; died recently, aged 70, from metastatic carcinoma of the liver.

**Oscar Maurice Shere** ✠ Denver; Gross Medical College, Denver, 1902; formerly instructor in surgery at the University of Colorado School of Medicine, Denver; member of the Western Surgical Association; one of the founders of the Jewish Consumptive Relief Society; died, October 17, aged 44, at St. Joseph's Hospital, following an operation.

**Robert Tilford Pirtle** ✠ Louisville, Ky.; Medical Department, University of Louisville, 1902; formerly assistant in orthopedics at his alma mater; served in the M. C., U. S. Army, during the World War, with rank of captain; aged 43; was killed, October 15, when the automobile in which he was driving overturned.

**Edwin Thompson Jaynes,** Waterloo, Iowa; Rush Medical College, Chicago, 1894; member of the Iowa State Medical Society; served in the M. C., U. S. Army, with rank of captain, during the World War; died recently, aged 53, at the Synodical Presbyterian Hospital, from meningitis, following abscess in the ear.

**Joseph Augustus Guinn,** Conyers, Ga.; Atlanta Medical College, Atlanta, Ga., 1885; member of the Medical Association of Georgia; for several years president of the board of health; member of the school board; died, October 3, aged 56, at the Wesley Memorial Hospital, Atlanta.

✠ Indicates "Fellow" of the American Medical Association.

**Charles Andrew Kepner,** Allentown, Pa.; Temple University Department of Medicine, Philadelphia, 1921; recently completed his internship at the Samaritan Hospital, Philadelphia; editor of the *"Medical Templar";* died, October 19, aged 25, at the Sacred Heart Hospital.

**James Woodward George,** Minneapolis; University of Minnesota College of Medicine and Surgery, Minneapolis, 1902; member of the American Association of Anesthetists; on the staff of the Abbott Hosptial; aged 53; died suddenly, from heart disease, October 16.

**John Whitehurst Stewart,** Washington, D. C.; Medical Department of Columbian University, 1900; member of the Medical Society of District of Columbia; formerly on the staff of the Sibley Hospital; died, October 13, aged 50, from cerebral hemorrhage.

**Robert A. Lancaster,** Columbia, S. C.; Medical College of Virginia, Richmond, Va., 1882; member of the South Carolina Medical Association; at one time president of the Florida Medical Association; died, October 16, aged 62, from cerebral hemorrhage.

**James Monroe Howell,** Haleyville, Ala.; Memphis Hospital Medical College, Memphis, 1904; member of the Medical Association of Alabama; aged 40; was instantly killed, September 24, when the automobile in which he was driving was struck by a train.

**Dodson Wright Tidmore,** Black, Ala.; University of the South, Medical Department (Sewanee Medical College), Sewanee, Tenn., 1899; member of the Medical Association of the State of Alabama; died recently, aged 49, from cerebral hemorrhage.

**Eugene Kelso Anderson,** St. Charles, Iowa (licensed, Georgia, 1898); member of the Iowa State Medical Society; aged 55; was instantly killed, October 14, when the car in which he was driving was struck by a train.

**Francis Craft,** East Stroudsburg, Pa.; Catholic University, Louvain, Belgium, 1870; gave up the practice of medicine to become a Roman Catholic priest; died, September 11, aged 68, from hemorrhage of the stomach.

**Levi Atchley Golden,** Denver; Rush Medical College, Chicago, 1880; formerly president of the state board of health; at one time surgeon for the Chicago, Rock Island and Pacific Railway; died, October 16, aged 64.

**Emanuel Allison Alleman,** Berwick, Pa.; Medico-Chirurgical College of Philadelphia, 1890; member of the Medical Society of the State of Pennsylvania; member of the school board; died, October 16, aged 69.

**George H. Newton,** Waterbury, Vt.; University of Vermont College of Medicine, Burlington, Vt., 1891; died, September 13, aged 53, at the Fanny Allen Hospital, Winooski, Vt., following an appendectomy.

**Abraham G. Bowman,** Lancaster, Pa.; University of Pennsylvania, School of Medicine, Philadelphia, 1864; member of the Medical Society of State of Pennsylvania; died, September 23, aged 80, from senility.

**John VanDolah Schofield,** Inspiration, Ariz.; Miami Medical College, Cincinnati, 1878; member of the Arizona Medical Association and the Colorado State Medical Society; died, October 13, aged 67.

**James Louis Quesenberry,** Worthington, Ky.; Medical Department, University of Louisville, 1882; member of the Kentucky State Medical Association; deputy county assessor; died, October 14, aged 64.

**Henry Jackson,** Salem, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1882; formerly county physician; died, October 12, aged 73, at the West Jersey Homeopathic Hospital, Camden.

**Charles Elliott Cook,** Lockport, N. Y.; Bellevue Hospital Medical College, New York City, 1866; Civil War veteran; died, October 11, aged 81, at the Lockport City Hospital, from pneumonia.

**Richard Whiteford,** Toledo, Ohio; McGill University Faculty of Medicine, Montreal, Que., 1857; examiner of the Toledo Medical College; died, October 10, aged 87, following a short illness.

**Charles L. Holt,** Bellingham, Wash.; Berkshire Medical College, Pittsfield, Wash., 1864; also an aurist and oculist; aged 83; died, October 14, at a local hospital, from cerebral hemorrhage.

**William Henry Cooke,** Long Beach, Calif.; Trinity Medical College, Toronto, Ont., Canada, 1888; aged 67; died recently, in Redondo Beach, from heart disease.

**Leslie James Parker,** Hugo, Colo.; Denver and Gross College of Medicine, Medical Department, University of Denver, 1910; died at the Parker Hospital, October 16, aged 35, from pneumonia.

**Anthony T. Schmit,** Beloit, Wis. (licensed, Wisconsin, 1899); member of the State Medical Society of Wisconsin; died, October 8, aged 59, from heart disease and chronic nephritis.

**Michael William Murray** ✙ Albany, Ala.; McGill University Faculty of Medicine, Montreal, 1890; aged 61; was killed, October 10, when he fell from a train near Columbia, Tenn.

**Nelson O. Benson,** Randlett, Okla. (licensed, years of practice); aged 51; died, August 27, at the Central Oklahoma State Hospital, Norman, Okla., from cerebral hemorrhage.

**Walter H. Keesee,** Denver; St. Louis College of Physicians and Surgeons, St. Louis, 1891; member of the Colorado State Medical Society; aged 51; died suddenly, October 5.

**George Pierce Pipkin,** Lancaster, Texas; University of Texas Department of Medicine, Galveston, Texas, 1898; died, October 13, aged 52, following an appendectomy.

**James Lumsden Addison,** St. George, Ont.; McGill University, Faculty of Medicine, Montreal, Que., Canada, 1884; died, October 6, aged 68, from pernicious anemia.

**Irving John Cross,** Walpeton, N. D.; University of Michigan Medical School, Ann Arbor, 1904; aged 49; hung himself, October 24, while temporarily insane.

**Christo Theodoroff** ✙ Detroit; Washington University Medical School, St. Louis, 1909; died, August 11, aged 47, at Powell, Mich., from diabetes.

**Elbert Arthur Norton** ✙ Houston, Texas; Baltimore University School of Medicine, 1904; died suddenly, October 5, aged 45, from heart disease.

**William Conner Ranson,** Blairsville, Pa.; Hahnemann Medical College of Philadelphia, 1882; died, October 7, aged 61, from chronic nephritis.

**Oliver Hollinger Lau,** Detroit; University of Michigan Medical School, Ann Arbor, 1882; died, October 13, aged 67, from cerebral hemorrhage.

**Demetrius Jones Prather,** Laton, Calif.; Louisville Medical College, Louisville, Ky., 1876; aged 73, died, October 5, from cerebral hemorrhage.

**Elijah William Ryon,** Wilmington, Del.; Medico-Chirurgical College of Philadelphia, 1904; died, October 16, aged 39, from heart disease.

**William Burr Caldwell,** Monticello, Ill.; Rush Medical College, Chicago, 1875; also a druggist; died, October 11, aged 83, from senility.

**William Cloyd Guss,** Hannibal, Mo.; Missouri Medical College, St. Louis, 1899; aged 57; died, October 16, from cerebral hemorrhage.

**John Charles Whiteaker,** Seattle; University of Oregon, Medical School, Portland, 1910; died, September 3, aged 38, from heart disease.

**J. Levi Lord,** Mays, Ind.; Medical Department of Butler University, Indianapolis, 1882; died, October 17, aged 64, from heart disease.

**Charles Payne,** Union City, Pa.; University of Wooster, Medical Department, Cleveland, 1869; died, October 13, aged 77, from senility.

**Charles H. Walters,** Quanah, Texas; Marion-Sims College of Medicine, St. Louis, 1895; died, September 29, aged 57, at Waverly, Ill.

**Charles F. Manson,** Philadelphia, Hahnemann Medical College, Philadelphia, 1876; died, October 16, aged 66, following a long illness.

**J. J. W. Glenn,** Conyers, Ga.; Medical College of Georgia, Augusta, Ga., 1852; aged 90; died, September 20, from carcinoma.

**Arthur W. Oharro,** Chicago; Rush Medical College, Chicago, 1896; died, October 20, aged 52, from carcinoma of the tongue.

**Theodore Drozdowitz** ✙ Chicago; Rush Medical College, Chicago, 1897; died, October 21, aged 54, from heart disease.

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**Correction.**—Newspaper clippings from several New York papers, July 8, stated that Dr. W. J. Wanless had died suddenly in India. Dr. Wanless writes from Shangli-Miraj that the report of his death, published in THE JOURNAL, July 22, is "greatly exaggerated."

# The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

## ABRAMS' "OSCILLOCLAST"

### Some of the Lessees of this Alleged Therapeutic Device *

It is no longer necessary to tell the readers of THE JOURNAL who Albert Abrams is. Although a sensational magazine that has opened its reading pages—and incidentally its advertising pages—to Abrams' disciples has charged that "the American medical profession, comprising some 140,000 physicians . . . have done their utmost to keep the great news for which humanity has been waiting in agony for centuries from reaching the public," the "great news" seems to have leaked out.

Abrams' "Oscilloclast," it will be remembered, is a piece of electrical apparatus, which is said to produce vibrations of varying rates. Its use is based on Abrams' theory that "specific drugs possess a like vibratory rate as the diseases for which they are effective." Instead of using a drug, one starts the "Oscilloclast" going, moves the indicator to the number corresponding to the vibration rate of the drug wanted and applies the instrument to the sufferer, who, it is alleged, then gets the therapeutic action of the drug in question. The "Oscilloclast" is not for sale; it can be leased by those who are willing to pay the price (about $200) and who will sign a contract that they will not open it!

Mr. Upton Sinclair who is convinced that Albert Abrams is the medical Merlin of the twentieth century, tells us that "a great number of physicians who are using this instrument ["Oscilloclast"] are today enjoying incomes of from $1,000 to $2,000 per week." Needless to say, it will take a good deal of argument to persuade these men that Abrams "Oscilloclast" belongs in the same category as Elisha Perkins' "Tractors."

Within the past few months—since, in fact, he withdrew from his local medical society and the American Medical Association—Abrams has been making frank bids for osteopathic patronage. Followers of that cult have not been slow to respond; the lure of the dollar and the bizarre is irresistible. Up until March, 1922, there were listed among the lessees of the "oscilloclast" 166 physicians and 2 osteopaths. On March 25, 1922, the first article on Abrams appeared in THE JOURNAL. Since that time the additional lessees of the "oscilloclasts" comprise 51 physicians and more than 130 osteopaths.

Attention has already been called to the fact that in checking up the published lists of those who are leasing the "oscilloclast" it was found that many of the names were already in Propaganda files in some other connection.

The names of nearly 100 lessees of the "oscilloclast" appeared previously in the Propaganda files of THE JOURNAL. Some were in the "advertising specialist" business—we reproduce some of their old advertising—but the majority of the names in the files are of individuals who for years have lived in what we have called the twilight zone of professionalism, where it is difficult to distinguish between the visionary with a fad and the quack or near-quack with a scheme.

A surprising number of "oscilloclast" lessees have also been engaged in the "Auto-Hemic Therapy" business, which was the subject of an extended article in the Propaganda department of THE JOURNAL, Feb. 14, 1920. Many are members of the "Orificial Surgery" cult; a fair sprinkling belonged to the "National League for Medical Freedom," while some are members of the later organization, the "American Medical League." A large number are, or have been, members of that egregious aggregation calling itself the "Allied Medical Associations of America." Some of these write panegyrics of Abrams in the official publication of that organization; these Abrams quotes with evident satisfaction, giving credit to "J.A.M.A.A." Many readers imagine, doubtless, that the references are to the J.A.M.A.

Following are brief sketches of but a few of the individuals who are not only lessees of the "oscilloclast" but whose names also figure in the Propaganda files:

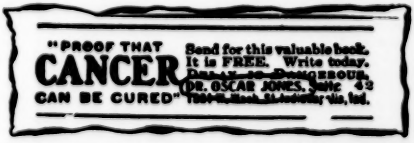
COOPER, F. M., Colorado Springs, Colo.—Born in 1854; graduated in 1877 by the American Medical College of St. Louis and in 1880 by the College of Physicians and Surgeons, Keokuk, Iowa. This man was for some time located at Manitou, Colo., where he taught "astrology by mail" and would render "Astrological Advice" on "all Law Questions"

MEDICAL ASTROLOGY IS OUR METHOD
of detecting disease, and selecting mostly root and herb remedies; and when prepared by our special Infusion Process, gives quickest results to treatment. Send stamp for circular.
Foot of Pike's Peak, Manitou, Col.
Dr. Cooper

(see illustration). He would, in fact, "ADVISE on all AFFAIRS of LIFE"—"Consultation Fees, from $10 to $25." According to Cooper's advertising matter, he is a "graduate of Astrology and of the Eclectic, Regular and Homeopathic schools of medicine and surgery." Cooper has claimed also to make a specialty in curing cancer "without caustics or cutting." Cooper has one "Oscilloclast."

BALDWIN, ZELL L., Kalamazoo, Mich.—Born in 1864; graduated in 1888 by the Eclectic Medical Institute, Cincinnati. For some years Baldwin was in Niles, Mich. While there, he seems to have dabbled in local politics, sold copper stock and established a so-called sanitarium for the exploitation of the "Hyer-Baldwin Treatment for Tuberculosis" (See "Nostrums and Quackery," Vol. 2, p. 26). According to Baldwin, the treatment, which was administered intravenously, was "the most positive of anything yet brought before the profession for tuberculosis." Finally, Baldwin left that city and went to Kalamazoo. There he opened the "Baldwin Sanitarium" which specialized in "The Intravenous Treatment for Tuberculosis" and "The Eye Repression Treatment for Goiter." When the L. D. Rogers "Auto-Hemic Therapy" fad was appealing to the type of physician that "fall for" such things, Baldwin apparently became one of the disciples, as his name appears as an officer of the "Auto-Hemic Therapeutic League." His name also appeared as an active member of the "Allied Medical Associations of America." Baldwin has one "Oscilloclast."

JONES, OSCAR, Indianapolis, Ind.—Graduated in 1901 by the Central College of Physicians and Surgeons, Indianapolis. For many years he has been in the "cancer cure" business



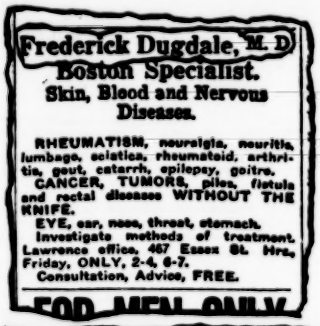

and has advertised "Cancer, My Cure is Guaranteed" (see illustration). While running his "medical non-surgical treatment of cancer" he also seems to have been connected with the "Medilation Co."—a medical, non-surgical treatment of piles, claiming to cure nine out of every ten patients that he accepted. Jones' name appeared as an officer in the "Allied Medical Associations of America." Jones has one "Oscilloclast."

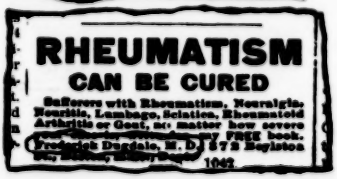
DOERN, WILLIAM G., Milwaukee, Wis.—Born in 1878; graduated in 1902 by the Keokuk Medical College. Doern's name appears as the giver of a testimonial on the "Bio-Dynamo-Chromatic System of Diagnosis." This freak system seems to have been developed by one George Starr White, originally a disciple but now a competitor of Abrams. Doern has eight "Oscilloclasts."

* Lack of space makes it impossible to give all the data available on this subject. A reprint of the Abrams matter, containing this and additional material, will be sent if the request is accompanied by a two-cent stamp.

FOWLER, WALTER N., Kalamazoo, Mich.—Born in 1867; graduated in 1889 by the University of Michigan, Homeopathic Department; received an Indiana license in 1897 and a Michigan license in 1911. For many years Fowler practiced at Bluffton, Indiana, and left that city under circumstances that brought a great deal of newspaper publicity but which, at this time, it is unnecessary to go into. In 1911 one of the owners of the "United Doctors" aggregation of advertising quacks, admitted under cross-examination that W. N. Fowler was one of their "noted specialists" in charge of the Logansport, Ind., office. In 1912 the Anderson (Ind.) newspapers reported that a "medical institute" operated by the Pettigrew Medical Company was going to be opened in that town and that Dr. W. N. Fowler would have charge of it. In 1914 and 1915 Fowler, judging from newspaper clippings on file, was in the "intravenous remedy" business. Fowler has one "Oscilloclast."

DUGDALE, FREDERICK, Boston, Mass.—Born in 1880; graduated in 1903 by the Baltimore Medical College. Has long advertised as a "Specialist in Rheumatism, Cancer, Chronic


Frederick Dugdale, M. D.
Boston Specialist.
Skin, Blood and Nervous Diseases.
RHEUMATISM, neuralgia, neuritis, lumbago, sciatica, rheumatoid, arthritis, gout, catarrh, epilepsy, goitre.
CANCER, TUMORS, piles, fistula and rectal diseases WITHOUT THE KNIFE.
EYE, ear, nose, throat, stomach.
Investigate methods of treatment.
Lawrence office, 467 Essex St. Hrs., Friday, ONLY, 2-4, 6-7.
Consultation, Advice, FREE.
FOR MEN ONLY

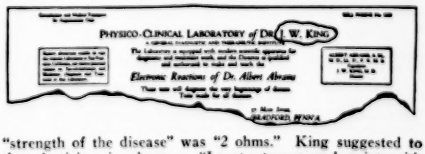

RHEUMATISM
CAN BE CURED
Sufferers with Rheumatism, Neuralgia, Neuritis, Lumbago, Sciatica, Rheumatoid Arthritis or Gout, no matter how severe
Frederick Dugdale, M. D.
1042

Blood and Nervous Diseases" (see illustration). Dr. Dugdale's name appears as "President" of the "Allied Medical Associations of America" for 1921-22; his name also appears as one of the officers of the "Medical Society of the United States," a similar organization. Dugdale has one "Oscilloclast."

GUILD, W. A., Des Moines, Iowa.—Born in 1879; graduated in 1903 by the Chicago Homeopathic Medical College. Guild's name has appeared as the Secretary-Treasurer of the "American Association of Orificial Surgeons" and as the secretary of the "Cancer Research Laboratory and Hospital of Chicago," a creation of L. D. Rogers, and located at the same place as Rogers' notorious "National Medical University." Guild seems to have conducted a so-called cancer sanitarium in Des Moines. His name also appeared as one of the officers of the "American Association of Progressive Medicine" and as a member of the executive committee of the "American Association for the Study of Spondylotherapy." Guild's name appears as Secretary-Treasurer for Iowa, 1919, of the "Medical Society of the United States"; his name is published by L. D. Rogers among those who have "traveled hundreds of miles to see me and take a personal practical course of instruction in Auto-Hemic Therapy." Guild has one "Oscilloclast."

JACOBS, W. K., Montgomery City, Mo.—When this man arrived in Montgomery City in 1916 he was announced in the local papers as an "Osteopath and Optician of Detroit, Michigan." In 1917 Jacobs seems to have conducted "The M & M Sanitarium" (see illustration) which exploited "The M & M Remedy," which in turn was said to "cure the drink habit" in twenty-four hours. In 1920 a Montgomery City paper contained a long article by a local minister regarding an alleged $3,000 pipe-organ that had been donated to the local Methodist Church "through the efforts of Dr. W. K. Jacobs of our city." The plan by which the church was to get a free pipe-organ, it seems, "was originated by Dr. Jacobs" who had "been in close touch" with some "successful oil producers in Texas" and who knew "from his own experience how desirable the stocks were which were put on the market by these producers." The good Methodists of Montgomery City would, of course, have "to sell or absorb a certain number of shares of one of their best dividend oil stocks, with the understanding that as soon as the required shares of stock were sold the company agreed to pay for and install any organ the church might select, the cost not to exceed $3,000." The local paper congratulated "the church, the company" and also "Dr. Jacobs . . . on the successful outcome of this undertaking." This was in June, 1920. In October, 1922, we were told that the Methodists of Montgomery City were still looking for their pipe-organ. W. K. Jacobs carries occasional announcements in the local newspapers regarding his Abrams "specialty"; he also advertises what is rather importantly termed the "Elmwood Hospital," a name that we understand Jacobs applies to his residence. Jacobs has one "Oscilloclast."

KING, J. W., Bradford, Pa.—Born in 1866; graduated in 1889 by Jefferson Medical College. This man operates what he is pleased to call the "Physico-Clinical Laboratory of Dr. J. W. King for the Electronic Reactions of Abrams" (see illustration). According to the stationery the "Director" of this concern is King himself; the "Consultant" is Albert Abrams. About a year ago a somewhat interesting case relative to one diagnosis made by King was brought to the attention of THE JOURNAL. In the case of a patient who was referred to King from another part of Ohio a diagnosis was made of "acquired syphilis (bovine type)." Before a satisfactory test (which proved negative) could be obtained from a *bona fide* laboratory, this report is said to have led to the institution of divorce proceedings. Another group of reports (on one individual) from King's "laboratory" is also of interest. The first report stated that the patient was suffering from "Sarcoma of the digestive tract" and that the

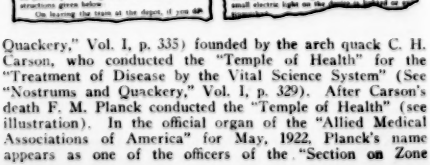



"strength of the disease" was "2 ohms." King suggested to the physician in charge: "Locate tumor and paint with safranin and over it apply Oscilloclast, current 3, without concussion, and then go to spleen and then concuss the seventh cervical." A month later King made another report on the same patient. The "strength of the disease" had been reduced to "1/25th of an ohm"! King remarked that the sarcoma was "now practically negligible, but continue the treatment." A little more than two weeks later a third report was made. At that time King reported "All reactions negative" and remarked "congratulations to you in having effected a cure in her case and let us all rejoice." The name of J. W. King also appears as one of the organizers of the "Society of Physical Therapeutists," which has for its presi-

dent T. Howard Plank (another "Oscilloclast" lessee). King's name also appears among the "Auto-Hemic Therapeutists," and in connection with the "Allied Medical Associations." King has seven "Oscilloclasts."

LINDLAHR, HENRY, Chicago, Ill.—Graduated in 1904 by "National Medical University" of Chicago. This "university" was run by L. D. Rogers, the "Auto-Hemic Therapy" gentleman. Some time ago newspapers reported that Lindlahr had announced that he had cured 200 cases of cancer in two years. Lindlahr has a "Nature Cure Institute." His treatment for diphtheria is: "Wet packs, no food except fruit juices, osteopathic treatment and—*no anti-toxin*." Lindlahr holds that vaccination is not only worthless as a protection against smallpox, but is one of the causes of cancer, tuberculosis, syphilis and insanity; he holds that the secondary and tertiary manifestations of syphilis are due to the treatment of syphilis by mercury, iodids and the arsenicals; he claims that syphilis, and even well-developed cases of locomotor ataxia can be cured by "natural methods"—"These facts," he says, "are proven beyond doubt by the Diagnosis from the Eye." In addition to operating a "Nature Cure Institute" (see illustration) he is president of the "Lindlahr College of Natural Therapeutics," which gives a "course of instruction" that "is not taught elsewhere in America." One of the Lindlahr fads is what he calls "Iridiagnosis," by which, we are told, one is "able from the eye alone to tell the patient his inherited and acquired tendencies toward health and disease, his condition in general and the state of every organ in particular." Lindlahr's name appears as member of the 1922 Section on Iridology of the "Allied Medical Associations." Lindlahr has eight "Oscilloclasts."

PLANCK, F. M., Kansas City, Mo.—Born in 1868; graduated in 1904 by the Eclectic Medical University of Kansas City. The Eclectic Medical University graduated its first class in 1900 and, after various vicissitudes, became extinct in 1918. Planck, it seems, was for some time secretary of the "College of Psychic Sarcology" (See "Nostrums and Quackery," Vol. I, p. 335) founded by the arch quack C. H. Carson, who conducted the "Temple of Health" for the "Treatment of Disease by the Vital Science System" (See "Nostrums and Quackery," Vol. I, p. 329). After Carson's death F. M. Planck conducted the "Temple of Health" (see illustration). In the official organ of the "Allied Medical Associations of America" for May, 1922, Planck's name appears as one of the officers of the "Section on Zone Therapy." In 1915 Planck was featuring "Spondylotherapy," an earlier fad of Albert Abrams; at that time, also, Planck's name appeared as second vice-president of the "American Association for the Study of Spondylotherapy." His name was on the program following Albert Abrams for a paper on "New Methods and Unusual Cases by Reflexology." Planck has one "Oscilloclast."




POPE, R. D., Long Beach, Calif.—Born in 1869; graduated by George Washington University Medical School, 1897. Practiced at Du Quoin, Ill., practically from the time of his graduation until within the last two or three years, when he moved to Long Beach. His name appears as one of the officers of the "American Association of Orificial Surgeons" for 1919 and as an endorser of L. D. Rogers' "Auto-Hemic Therapy." Pope has two "Oscilloclasts."

SWAYZE, BURTON W., Allentown, Pa.—Born in 1868; graduated in 1891 by Jefferson Medical College. Swayze is a great "booster" for Albert Abrams. An extensive puff of the Abrams method, in the form of a contributed article, appeared under Swayze's name in a sensational lay magazine that has seen fit to espouse Abrams' cause—and incidentally get some advertising from some of Abrams' disciples. A puff on the same subject by Swayze has also been published in the *Medical Herald and Electro Therapeutist*. Abrams' house-organ, *Physico-Clinical Medicine*, for March, 1922, contained an article by Swayze, as did also the same publication for June, 1922. We have in our files a number of advertisements of the "men specialists" type published by Swayze in Allentown newspapers (see illustration). Swayze has one "Oscilloclast."

Are Your Vitals Sound ?
I AM Having Wonderful Results Daily, Restoring Men of All Ages to Robust Health. STRONG NERVES AND SOUND VITALS MEAN A MORE SUCCESSFUL LIFE. IT GIVES A MAN THE SPIRIT TO GO AHEAD. YOU HAVE MORE AMBITION WITH GREATER MENTAL AND PHYSICAL STRENGTH.
FOR YOUNG MIDDLE-AGED OLD MEN
"VITOSERUM" IS INDICATED
$25.00 Treatments for $12.50
MEN
DR. SWAYZE
You Can Be Restored
Located in Allentown Over Eighteen Years, The Men's Doctor Who Stays Here.

HANOR, W. A., Corning, N. Y.—Born in 1879; graduated in 1903 by the Syracuse University, College of Medicine. His name appeared as a member of the "Central Society of Physical Therapeutists." In one of the advertising leaflets put out by L. D. Rogers on "Auto-Hemic Therapy" appears some "clinical reports" credited to Hanor. Hanor's name appears as "Second Vice-President" of the "Allied Medical Associations" for 1922; it also appears as an officer of the "Section of Electronic Diagnosis and Therapy," as an officer of the "Section on Anesthetics" and as an officer of the "Section on Irodology" (whatever that may be), also as a member of the "Committee on Ethics"—all of the "Allied Medical Associations." On the 1922 program of this same organization Hanor's name was down for a paper on the "Electronic Therapy made Practical for the Diagnosis and Treatment of Disease." Hanor has two "Oscilloclasts."

## Correspondence

### CHANGING CONDITIONS IN VIENNA

*To the Editor:*—Perhaps American physicians are interested in knowing how the war and subsequent events have affected Vienna as a teaching center. One hears conflicting reports in America about the medical teaching situation here. The purpose of this letter is to comment not only on present conditions in Vienna, but also on tendencies which point unmistakably to what the future is likely to bring.

Today, Vienna still holds first place in Europe as a graduate medical teaching center. Its organization, personnel and prestige have thus far kept the machine going fairly well from sheer force of its own momentum. But even the casual observer must conclude that its days of leadership are numbered. It cannot escape the distintegrating influences of poverty. The amount and variety of clinical material in some departments, indeed in most departments, have lately suffered a severe slump. I learned today that one clinic, which formerly treated from 15,000 to 20,000 patients a year, is to be closed entirely. A vacant professorship in another highly important department has been offered to various men, but it is still vacant. Motives of economy inspired a recent law which denies free treatment to members of Krankenkassen. Each society must pay for its members who are treated in the hospital. This law appears to be one of the big factors in reducing the number of patients and the amount of clinical material for teaching purposes.

In the days of the empire, a research worker here could commandeer any patients he wished to study from Prague, Budapest, and other medical centers. Now, it is impossible. Furthermore, some of the research workers who have made Vienna famous are now obliged to devote their energies to earning a livelihood. Earning a living in Vienna at present is not conducive to that serenity of mind which is so essential to satisfactory teaching and research work. Salaries paid by the university are hopelessly inadequate. This week, Austrian kronen are selling at the rate of 74,000 for a dollar. Living costs have increased by leaps and bounds in the past two months. Six months ago, the price of street railway fares was 80 kronen. Today, it is 1,700 kronen. This great increase in the cost of transportation is one of the causes of the falling off in the amount of clinical material for teaching purposes. For example, a mother taking her child to the outpatient department of a clinic must pay for herself and child 6,800 kronen for the round trip on the street car —a burden sufficient to reduce the attendance at clinics enormously.

The American colony, which is the real meal ticket for many of the medical teachers, is undergoing noticeable changes. Not only is it showing a tendency to fall off in numbers: the students do not remain here so long as they formerly did. Many students who come with the expectation of staying from six to twelve months leave after a few weeks.

From the foregoing, it must not be inferred that there is no longer any good teaching done in Vienna. On the contrary, work of the highest order is still being done in most departments in spite of grave handicaps. The clinical departments of medicine and surgery are the first to suffer, and it is hard to see how a slow, but progressive, deterioration can be prevented. Defections in the teaching ranks have not yet been numerous, but I believe they will become more so as opportunity offers, for the brighter men among the younger teachers go to more promising parts of the world.

An observer with a broad perspective cannot escape the feeling that Vienna herself is moribund. Unless help comes from unexpected sources, the supremacy of this famous medical teaching center appears doomed to certain, if gradual, decline.

CHESTER M. ECHOLS, M.D., Vienna, Austria. (Milwaukee.)

### INFECTIOUS JAUNDICE—INFORMATION WANTED

*To the Editor:*—For the last seven or eight months, I have been endeavoring through correspondence to obtain information regarding infectious jaundice in the United States.

The disease is seldom fatal and usually takes the form of rather sharply localized endemics. For these two reasons, it is not a reportable disease in most states, though it has been made reportable in a few states within the last year or two. I have been able to obtain a good deal of information from state boards of health and from individuals; but I feel confident that the disease is much more widespread than my information would indicate, and I am, therefore, writing to THE JOURNAL in the hope that this request for information will meet the eye of physicians who have observed even small outbreaks of infectious jaundice and that they will write me a brief statement to that effect, giving such details as they may have the time to present.

GEORGE BLUMER, M.D., New Haven, Conn.

## Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

### DIABETES — CAROID

*To the Editor:*—Kindly answer the following questions: 1. What do you think of the serum prepared by physicians of the University of Toronto? According to the lay press, "it will do for diabetes what antitoxin has done for diphtheria." (I am referring to Mr. Brisbane's recent editorial.) 2. What is caroid? I should like to know something about its composition, action, and uses, if any. This product is manufactured by the American Ferment Company, Buffalo.

AARON DUBNOVE, M.D., Detroit.

ANSWER.—1. See editorial, "A Pancreatic Hormone in Diabetes," THE JOURNAL, Oct. 21, 1922, p. 1428. The preparation is undergoing thorough trial by expert investigators in properly controlled hospitals and is not available for general use. While promising, it must be considered as in the experimental stage.

2. Caroid is a preparation of papain (obtained from papaya). Caroid was first marketed by the American Ferment Company, and later by Mead Johnson & Company. The Council on Pharmacy and Chemistry had Caroid under consideration for a considerable time and in the end rejected the product on account of its variability. Examination showed that the claims for its digestive efficiency were exaggerated. Though Caroid was found more active than other preparations of papain on the market, and though its curdling effect on milk indicated some advantages, the Council refused recognition to Caroid because the manufacturer admitted that, because of the indefinite source of supply of papaya, he could not produce a reliable and uniform product. Since the publication of the Council's report in 1914, Mead Johnson and Company does not seem to have made any propaganda for Caroid. It is now being promoted by the American Ferment Company, but this firm has not requested a reconsideration of the product by the Council.

**Infant Mortality in New Zealand.**—New Zealand has been for years the country with the lowest infant mortality rate. It has also been the pioneer in systematic development of infant welfare work. New Zealand showed, in 1908, an infant mortality rate of 68 per thousand live births—a rate considerably lower than the present rate of 94 per thousand in the United States. Since 1908, New Zealand's rate has been steadily lowered; the latest figure, for the years 1917, is 48 per thousand.

# Medical Education, Registration and Hospital Service

## COMING EXAMINATIONS

ARKANSAS: Little Rock, Nov. 14-15. Sec., Reg. Bd., Dr. J. W. Walker, Fayetteville; Sec., Eclec Bd., Dr. C. E. Laws, 803½ Garrison Ave., Fort Smith; Sec., Homeo. Bd., Dr. George M. Love, Rogers.

CONNECTICUT: Hartford, Nov. 14-15. Sec., Reg. Bd., Dr. Robert L. Rowley, 79 Elm St., Hartford.

CONNECTICUT: New Haven, Nov. 14-15. Sec., Eclec. Bd., Dr. James F. Hair, 730 State St., Bridgeport; Sec., Homeo. Bd., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven.

DELAWARE: Wilmington, Dec. 12-14. Sec., Dr. P. S. Downs, Dover.

LOUISIANA: New Orleans, Nov. 30-Dec. 2. Sec., Dr. Roy B. Harrison, 1507 Hibernia Bank Bldg., New Orleans.

MAINE: Portland, Nov. 14-15. Act. Sec'y., Dr. Adam P. Leighton, Jr., 192 State St., Portland.

MARYLAND: Baltimore, Dec. 12. Sec., Dr. J. McP. Scott, 141 W. Washington St., Hagerstown.

MASSACHUSETTS: Boston, Nov. 14-16. Sec., Dr. Samuel H. Calderwood, 144 State House, Boston.

MISSOURI: Kansas City, Nov. 20-23. Sec., Dr. Cortez F. Enloe, State House, Jefferson City.

NEBRASKA: Lincoln, Nov. 6-8. Sec., Mr. H. H. Antles, Capitol Bldg., Lincoln.

NEVADA: Carson City, Nov. 6. Sec., Dr. Simeon L. Lee, Carson City.

NORTH CAROLINA: Durham, Dec. 12. Sec., Dr. Kemp P. B. Bonner, Raleigh.

OHIO: Columbus, Dec. 6-8. Sec., Dr. H. M. Platter, Hartman Hotel Bldg., Columbus.

SOUTH CAROLINA: Columbia, Nov. 14. Sec., Dr. A. Earle Boozer, 1806 Hampton St., Columbia.

TEXAS: Waco, Nov. 28-30. Sec., Dr. T. J. Crowe, Dallas County Bank Bldg., Dallas.

VIRGINIA: Richmond, Dec. 5-8. Sec., Dr. J. W. Preston, McBain Bldg., Roanoke.

### Ohio June Examination

Dr. H. M. Platter, secretary, Ohio State Medical Board, reports the oral, written and practical examination held at Columbus, June 6-9, 1922. The examination covered 11 subjects and included 110 questions. An average of 75 per cent. was required to pass. Of the 164 candidates examined, 160 passed and 4 failed. Seventeen candidates were licensed by reciprocity. The following colleges were represented:

| College | PASSED | Year Grad. | Per Cent. |
|---|---|---|---|
| Rush Medical College | | (1922)* | 82.1 |
| Johns Hopkins University | 82.6, (1921) 88.1, | (1922) | 86.4 |
| Harvard University | | (1919) | 83.6, 83.7 |
| Tufts College Medical School | | (1919) | 87.7 |
| St. Louis University School of Med. | (1921) 85.5, | (1922) 81.9, | 85.2,86 |
| University and Bellevue Hospital Medical College | | (1910) | 85 |
| Eclectic Medical College | 81.9, 82.5, 83.3, 83.4, 83.8, 84.2, 85.1, 85.3, 85.5, 85.7, 85.8, 85.9, 86, 86.4, 88.4 | (1922) 75.9, 76, 77.1, 78.3, 79.9, | 81.2, 81.8, |
| Ohio State University College of Homeopathic Med. | 81, 82.5, 84.1, 84.2, 84.4, 85.5 | (1922) | 79.6, |
| Ohio State University College of Medicine | 81.2, 81.8, 82.6, 82.7, 83, 83.1, 83.5, 84.1, 84.3, 84.4, 84.5, 84.5, 84.5, 85.2, 85.7, 85.8, 85.8, 85.8, 85.8, 86, 86, 86, 86.2, 86.7, 87.8, 88.3, 88.3, 88.5, 89.7, 90.8 | (1922) | 76.2, |
| University of Cincinnati College of Medicine | 79.4, 79.5, 79.6, 79.7, 80, 80.5, 80.5, 80.6, 81.1, 81.4, 81.4, 81.4, 81.8, 81.8, 82, 82.4, 82.7, 82.8, 83.1, 83.2, 83.3, 83.4, 83.9, 84.3, 84.5, 84.5, 85.3, 85.5, 85.5, 85.5, 85.6, 86.2, 86.4, 86.6, 86.6, 86.8, 87.1, 87.1, 87.4, 87.5, 87.7, 88.1 | (1922) | 79.3, |
| Western Reserve University | 82.7, 83, 83.4, 83.8, 84.4, 84.9, 85, 85, 85.4, 85.5, 86, 86.7, 86.9, 87, 87.4, 87.5, 87.5, 87.6, 87.9, 88.3, 88.3, 89.1, 89.4, 90.2, 90.4 | (1922) | |
| Jefferson Medical College | | (1921) | 88.9 |
| University of Pennsylvania | | (1921) | 82.5 |
| University of Pittsburgh | 83.8, 84.3, 84.7, 86.1, 86.2, 88.2, 89.4 | (1921) 85.6, (1922) | 82.4, |
| Meharry Medical College | | (1922) | 75, 75.7, 76 |
| University of Toronto | | (1913) | 82.1 |
| University of Vienna | | (1908)† | 82 |
| University of Budapest | | (1914)† 81, (1915)† | ‡75 |
| University of Naples | | (1919)* | 79.1 |
| University of Tomsk | | (1915)† | ‡75 |

FAILED

| | | |
|---|---|---|
| Loyola University | (1918) | 70.4 |
| Ohio State University College of Homeopathic Med. | (1921) | 71.6 |
| Meharry Medical College | (1917) | 61.4 |
| University of Naples | (1919)† | 73.4 |

| College | LICENSED BY RECIPROCITY | Year Grad. | Reciprocity with |
|---|---|---|---|
| Northwestern University | | (1899) | New York |
| Rush Medical College | | (1921) | Illinois |
| University of Illinois | | (1914) | Illinois |
| Woman's Medical College | (1890) Indiana, | (1899) | New York |
| University of Louisville Medical Department | | (1921) | Kentucky |
| Tulane University | | (1916) | Mississippi |
| Johns Hopkins University | | (1916) | Maryland |
| University of Maryland | | (1921) | Maryland |
| St. Louis University School of Medicine | | (1921, 3) | Missouri |
| New York Homeopathic Medical College and Flower Hospital | | (1921) | New York |
| Jefferson Medical College | | (1906), (1920) | Penna. |
| University of Pennsylvania | | (1918) | California |
| Queen's University | | (1900) | Washington |
| National University, Athens | | (1911)† | W. Virginia |

* This candidate has finished the medical course and will obtain the M.D. degree after he has completed a year's internship.

† Graduation not verified.

‡ Percentage given for years of practice.

# Medical Economics

## A PHARMACEUTICAL CODE OF ETHICS

At its reorganization meeting in August, the American Pharmaceutical Association adopted a code of ethics. The code, which is brief, consists of three chapters concerning, respectively, the relations of the pharmacist to the public, to the physician and to other pharmacists. Many sections of the code, in addition to that dealing with medical relations, are of interest to the medical profession. Pharmacists are urged to uphold the legal standards of the Pharmacopeia and the National Formulary, and to encourage the use of official drugs and discourage the use of objectionable nostrums. They are asked to exert care in selling poisonous substances. They are urged to consider knowledge gained of ailments of their patrons as given in confidence. It is inimical to public welfare, says the code, for the pharmacist to have any clandestine arrangement for the division of fees or for the preparation of secret prescriptions. Of the relation of the pharmacist to the physician the code says:

> The pharmacist, even when urgently requested so to do, should always refuse to prescribe or attempt diagnoses. He should, under such circumstances, refer an applicant for medical aid to a reputable, legally qualified physician. In cases of extreme emergency, as in accident or sudden illness on the street in which persons are brought to him pending the arrival of a physician, such prompt action should be taken to prevent suffering as is dictated by the humanitarian impulses and guided by scientific knowledge and common sense.
>
> The pharmacist should not, under any circumstances, substitute one article for another, or one make of an article for another in a prescription, without the consent of the physician who wrote it. No change should be made in a physician's prescription except such as is essentially warranted by correct pharmaceutical procedure, nor any that will interfere with the obvious intent of the prescriber, as regards therapeutic action.
>
> He should follow the physician's directions explicitly in the matter of refilling prescriptions, copying the formula on the label or giving a copy of the prescription to the patient. He should not add any extra directions or caution or poison labels without due regard for the wishes of the prescriber, provided the safety of the patient is not jeopardized.
>
> Whenever there is doubt as to the interpretation of the physician's prescription or directions, he should invariably confer with the physician in order to avoid a possible mistake or an unpleasant situation.
>
> He should never discuss the therapeutic effect of a physician's prescription with a patron or disclose the details of composition which the physician has withheld, suggesting to the patient that such details can be properly discussed with the prescriber only.
>
> When an obvious error or omission in a prescription is detected by the pharmacist, he should protect the interests of his patron and also the reputation of the physician by conferring confidentially on the subject, using the utmost caution and delicacy in handling such an important matter.

This code is an appeal to the ideals which have marked pharmacy as a science and a profession since the days when the preparation of medicine was an art and when the pharmacist was the dignified assistant of the physician. Observance of the code by the pharmacist and teaching it to the students of today promise much for the pharmacy of the future.

**U. S. Bureau of Mines.**—Accidents at all mills and smelters, excluding iron blast furnaces, operated in the United States in 1921, resulted in the death of twenty-seven employees and the injury of 4,494, according to reports received from operating companies by the federal bureau of mines. In the preceding year, sixty-one employees were killed and 8,863 were injured. At milling plants, 10,047 men were employed and at the smelters 18,656 men worked 5,733,969 shifts. During the fiscal year recently ended, 16,291 persons associated with the mineral industries were trained in mine rescue or first-aid work by the bureau.

# *Miscellany*

## ANTON CHEKHOV—PHYSICIAN AND LITERARY ARTIST

HERBERT THOMS, M.D.
NEW HAVEN, CONN.

In 1892, cholera became epidemic in Russia. Among the physicians who responded to the call for volunteers was a young man from the town of Melihova. Although sick himself with pulmonary tuberculosis, he served many months in the Moscow district without pay. Day and night he drove countless miles over wretched roads to visit patients, and at times for days he scarcely removed his clothing. The district he served comprised twenty-five small villages, and here the young physician remained many months until the spread of the epidemic was checked.

This event in the life of Anton Chekhov gives us the keynote to his whole life and character. These are worth considering, for he was one of the great literary geniuses of his time, and wrote at least one play that has been placed by able critics among a half dozen of the greatest dramas since Shakespeare. Since his death in 1904, the fame of Chekhov as a literary artist has steadily increased, and today he stands in a small group of the greatest masters of the short story that we have known.

Chekhov wrote about three hundred short stories, and about a dozen plays. In all of these he created an atmosphere of subtle mystery and a veiled philosophy that one may never discover unless one looks beyond the words of those who people his stories, and knows the noble character of the man who wrote them. It was through a physician's eyes that Chekhov saw his world, and it is the spirit of the physician that pervades his entire art.

### CHEKHOV'S LIFE

Anton Chekhov's grandfather was a serf, or slave, who purchased freedom from a nobleman for himself and family for 3,500 roubles, 700 roubles per soul, with one daughter Alexandra thrown in for good measure. His father was an unsuccessful grocer. Anton was born at Taganrog, a small seaport on a gulf of the Black Sea, Jan. 17, 1860. He had four brothers and one sister. While a boy, he attended the local Greek school; and, although his father was unsuccessful as a merchant, his devotion to his family was praiseworthy. He taught them music, singing, violin and piano; in fact, trained them into a choir. Languages they learned from a French governess. The influence of the mother is shown by Chekhov's remark in his later years, "Our talents we got from our father, but our souls from our mother."

In 1876, the family removed to Moscow, but Anton remained at Taganrog and went to high school, earning his own living and paying his own tuition. After three years, he joined the family and entered the university. The father at this time was working away from home, and the young medical student found himself at the head of a family, every one of whom worked for their common living. It was during this period that he did his first writing, publishing in some of the local newspapers short sketches, mainly of a humorous character.

In 1884, he received his degree, and the year afterward was spent practicing in a small hospital in a suburb of Moscow. He kept on with his literary work, however, declaring that "medicine is my lawful wife and literature is my mistress." In 1890, he made a journey to the penal settlement of Sahalin in Siberia, driving nearly the entire distance of 3,000 miles. This journey, a pure labor of love, was made in order that he might study at first hand the conditions of the Siberian prison system. He afterward published a series of articles on Sahalin, and two short stories of the life there. Chekhov unquestionably influenced later reforms.

In 1892, as a physician and member of the sanitary council, he was asked by the zemstvo, or municipal council, to take charge of a section of the province to aid in combating cholera. He immediately accepted, and gave his services free. He showed unusual executive ability in organizing his district, establishing hospitals, delivering lectures and driving all over the territory day and night to see patients.

After this service he made Melihova his permanent home, developing his farm there, writing, and practicing his calling among the poor of his district. In 1896, he again became active in civic affairs while a census of the people was being taken. Although weakened by his disease, and by a severe attack of influenza, he carried on his work alone, going from village to village gathering statistics. In 1897, after an unusually severe pulmonary hemorrhage which necessitated hospital treatment at Moscow, he journeyed south, spending the autumn and winter at Nice. In 1900, he lived in Moscow again, and in May, 1901, he was married to Olga Knipper, a leading actress at the Art Theater. From this time until his death, his life was spent fighting disease, seeking health in various places in Europe. He died at Badenweiler in the Black Forest, July 2, 1904.

Such is the bare outline of the life of Anton Chekhov, a life uneventful as far as triumphs in this world are concerned, but inspiring in its usefulness and inspiring in the same way that the life of Stevenson is, with the same silent suffering and the same basic optimism.

### HIS NOVELS

Some one has waggishly said that a Russian novel is one in which two people neither want each other nor get each other, and about this 450 profoundly melancholy pages are written. Two truths are evident here: It is true that Russian writers have been much more interested in delineating character than in developing plot, and it is also true that in Russian fiction more than any other we find the persistent theme of human suffering and despair. The souls of both nobleman and peasant have been laid bare by such writers as Gogol, Turgenef and Tolstoy. But no Russian author became the open enemy of the sluggishness, the stupor, the banality of the people, as did Chekhov. Story after story reveals the utter helplessness of his characters, living under the hopelessly stupid system. Character regeneration and heroic climax are never found.

Immediately you ask, What can be attractive about a fiction that always creates an atmosphere of such crushing discouragement? Strange to say, Chekhov is never dull. Indeed, his genius gives us characters which are so vibrant with personality that we are carried to the end of his stories expectantly, even though we know that hope is left behind.

Chekhov has been compared to de Maupassant, but his methods are the converse of that master of the short story. Unlike de Maupassant, Chekhov is never dramatic; he is usually pointless, and depends not on episode but wholly on character study complete in its environment. In sketches of but two or three pages, we find not only complete character delineation but also the entire atmosphere that surrounds it. Chekhov's genius enables him to bring before us, often in a single terse sentence, living beings in striking relief. He describes a young girl, "Tanya, small, pale and slight, with her collar bone showing, with her widely opened, her dark and clever eyes," or an old man, "Father Andrey, a lean, toothless old man whose face always looked as though he was just going to say something amusing," and these sentient, pulsating beings charm us. They fascinate us because they live not only in Russian villages but also in American villages, among our own acquaintances, in our own families. Underneath the apparent triviality of their speech is the soul

struggle of the author himself; his ceaseless attack against the banality and the stupidity of his country. Story after story reveals his intense and bitter hatred. So in his greatest play, "The Cherry Orchard," Trofinov says, "Meanwhile in Russia, only a few of us work. The vast majority of those intellectuals whom I know seek for nothing, do nothing, and are at present incapable of hard work." In another place, he writes, "Contempt for life, for suffering and for death, and so on, this is the philosophy best suited for the Russian Lie-abed."

It is the physician Chekhov who writes, "It does not matter that Anna should die in childbirth, but it does matter that all these Annas, Marfas, Pelagueyas, from dawn to sunset should be grinding away, ill from overwork, all their lives worried about their starving, sickly children; to be looking after themselves; they fade in youth, grow old very early, and die in filth and dirt; their children as they grow up go the same way, and hundreds of years slip by and millons of people live worse than animals—in constant dread of never having a crust to eat; but the horror of their position is that they have no time to think of their souls, no time to remember that they are made in the likeness of God: hunger, cold, animal fear, incessant work, like drifts of snow, block all the ways to spiritual activity, to the very thing that distinguishes man from the animals and is the only thing indeed that makes life worth living." "O Mother Russia," the heart of Chekhov cried, "what a burden of idle and useless people you still carry."

Professor Phelps must have had Chekhov in mind when he wrote, "A Russian novelist with a pen in his hand is the most truthful being on earth." Chekhov's sensitiveness to impression makes him always the unerring reporter. With the discerning eye of the physician, he picks out the vital essentials that make the ensemble lifelike. He tells us his own method in one of his letters: "I overhear a conversation on pessimism," he writes, "between two Russians, and my business is to report the conversation as I heard it, and let the jury, i. e., the readers, decide as to its value. My business is only to be talented, to be able to distinguish between important testimony, to be able to illuminate the characters and speak in their language. . . . My business is to show them as they are."

Chekhov's profession had great influence on his art. Every one of his characters is a pure psychologic study. Physicians frequent his pages incessantly. He himself believed that his training helped him greatly in writing stories and plays. "My Party," he wrote, "has pleased the ladies; they sing my praises wherever I go. It really isn't bad to be a doctor and to understand what one is writing about." It was through the physician's eyes that Chekhov saw the apathy and banality of those about him. One sees the author clearly in Kiriloff the physician, who "condemned Abogin and his wife, and all that class of persons who live in a rosy twilight and smell of perfumes; all the way he hated and despised them to the point of torture; and his mind was full of unshakable convictions as to the worthlessness of such people." Chekhov's experience in medical school, hospital, prison camp, registered on him as on a sensitive plate. The dumb mass of Russian humanity was to him a great sick animal, and it was by lessons of its indolence that he tried to waken it to activity.

### HIS CHARACTER

It is interesting to know that, in spite of his somber pen, Chekhov was not a gloomy person. He was, in fact, a cheerful, fun-loving soul, whose presence at dinner parties and social gatherings was eagerly sought. His friend Kuprin writes of his "incomparable spiritual firmness and beauty. . . . the most beautiful, refined, and spiritual face I have ever seen in my life." Gorky says, in his recollections: "In front of that dreary, gray crowd of helpless people there passed a great, wise and observant man; he looked at all these dreary inhabitants of his country, and with a sad smile, with a tone of gentle but deep reproach, with anguish in his face and in his heart, in a beautiful and sincere voice he said to them, 'You live badly my friends; it is shameful to live like that.'"

Chekhov's life, his struggle with poverty and tuberculosis, his love for the unostentatious, for the quiet outdoors, gave a sublimity to his character that one unconsciously reads in his stories. Gray toned they all are, sad in their extreme helplessness, yet it is in these very characters that the philosophy of their creator is revealed. A philosophy full of earnest hope and of the conviction of the coming of better things. Those who label him the "incorrigible pessimist" understand him not. One sees the author as Sasha the ill fated tuberculous artist in "Betrothed," who says, "Only enlightened and holy people are interesting; it is only they who are wanted. The more of such people there are, the sooner the kingdom of God will come on earth."

Chekhov has shown us the exact civilization in which he lived—peasant and nobleman, artist and poet, physician and priest, all of those with whom he came in daily contact, with their books, their plays, their actions and their thoughts. With gentle but unerring crayon, not one has been falsely drawn. Their usually unhappy lives are full of dissatisfaction, they are often stupid, and many times only the remnants of personality remain. These pictures are depressing, yes, but not hopeless. Let their author speak to us in the quiet voice of Sonia in the closing scene of "Uncle Vanya": "What can we do? We must live our lives. (A pause.) Yes, we shall live, Uncle Vanya, we shall live through the long procession of days before us, and through the long evenings; we shall patiently bear the trials that fate imposes upon us, we shall work for others without rest, both now and when we are old; and when our last hour comes we shall meet it humbly, and there beyond the grave, we shall say that we have suffered and wept, that our life was bitter, and God will have pity on us. Ah then, dear, dear Uncle, we shall see that bright and beautiful life; we shall rejoice and look back upon our sorrow here; a tender smile and we shall rest. I have faith, Uncle, fervent, passionate faith."

59 College Street.

## CHILD LABOR LESSENS ADULT EFFICIENCY

Both child and community are losers when children under the age of 16 years are gainfully employed, according to a report just issued by the U. S. Department of Labor. Such children have not received sufficient education to make them adaptable to changing industrial conditions, or to give them an understanding of the duties of citizenship. They are "subjected also to positive damage," the conclusions state, "from irregular habits of work, from labor unadapted to their needs and capacities, and from unsuitable associations and environments."

The study dealt with conditions which attended the entrance into working life of all children in Boston, Cambridge, Somerville, and Chelsea, Mass., who passed their fourteenth birthday in a given year and who entered employment within two years thereafter, a total of 5,692. Information concerning subsequent working histories was secured for a number of these children about three years later, and the advantage of those who had completed higher grades in school appeared at this time to have been pronounced. The report says "that even the small amount of education which the eighth-grade graduate could boast over the sixth-grade graduate was a real industrial asset."

The reason most frequently given by the children for going to work was that of necessity, but retardation and lack of adjustment to school life appeared to be important factors, as well. Of 3,399 who had entered full-time employment, 50.4 per cent. had not completed the eighth grade before entering industry.

# Book Notices

GASEOUS EXCHANGE AND PHYSIOLOGICAL REQUIREMENTS FOR LEVEL AND GRADE WALKING. By Henry Monmouth Smith. Paper. Price, $6. Pp. 310, with 43 illustrations. Washington: The Carnegie Institution of Washington, 1922.

This monograph, from the Carnegie Nutrition Laboratory, Boston, is a report of an extensive series of measurements of the energy required by standing, walking on a level, and walking up grade at varying speeds. The energy requirements were calculated from the gaseous exchange, the subjects being fitted with a gas mask that permitted accurate determination of oxygen consumption and carbon dioxid output. The results are not new to science, but are probably the most accurate and extensive so far reported. Considerable skill is shown in devising experimental procedures that permit accurate energy measurements without placing the subject in too abnormal conditions. Dr. Smith finds that standing requires about 12 per cent. more calories than lying horizontal, while horizontal walking requires about 0.5 gm. calory for each kilogram of body weight transported a distance of 1 meter. This factor remains practically constant up to a speed of walking exceeding 80 meters a minute. Beyond this point the energy requirement increases faster than the speed. In grade walking the average energy requirement was 7.5 gm. calories per kilogrammeter of work performed. This gives a net efficiency of 30 per cent. But if the grade or walking speed is such that the work done is more than 500 kilogrammeters a minute, the efficiency decreases. One unexpected result is reported, namely, that on horizontal walking the pulse rate was slower than on standing, even though the metabolic rate in walking was increased from 100 to 200 per cent. Most of the physiologic adjustments (pulse rate, respiration rate, etc) in passing from standing to walking is effected within thirty seconds, and, in normal persons, complete adjustment is attained at the end of the third minute.

MENTAL DISEASES. A Public Health Problem. By James V. May, M.D., Superintendent, Boston State Hospital. With a Preface by Thomas W. Salmon, M.D., Professor of Psychiatry, Columbia University. Cloth. Price, $5 net. Pp. 544. Boston: Richard G. Badger, 1922.

This is not a textbook of mental diseases. In Part I, which occupies the first 250 pages, Dr. May has compiled from many sources a mass of extremely valuable data, statistical and historical, which demonstrate the wide contact of psychiatry with problems of modern social life, indicate the growth and present status of psychiatric science and of the public care of mental disease, and point out the need for a common ground to serve as a basis for statistical studies essential for determining causes, and thus laying the foundation for rational steps towards prevention. This portion of the book can be most heartily recommended to the consideration of physicians and others interested in this most important field of public health work. Part II is a condensed account of the history, characteristics and relations with other systems of nomenclature of the various types of mental disease which comprise the standard classification adopted by the American Psychiatric Association. This, while essential for the public health purpose which the author has in view, is rather severely technical, and will appeal chiefly to those engaged specially in this field of medicine.

THE SURGICAL TREATMENT OF NON-MALIGNANT AFFECTIONS OF THE STOMACH. Charles Greene Cumston, M.D., and Georges Patry, M.D., Lectures at the University of Geneva, Switzerland. With an Introduction by Sir Berkeley G. A. Moynihan, K.C.M.G., C.B., M.S., Professor of Clinical Surgery, University of Leeds. Cloth. Price, $5. Pp. 349. Philadelphia: J. B. Lippincott Company, 1921.

This work might properly be called a "library monograph" in that it consists in a general, although not too comprehensive, outline of gastric surgery. It deals particularly with the historical development of technical ideas, and with the exposition of the work of various men who have written on the subject. A number of criticisms are called for. References to recent literature are too few compared to the many references to literature antedating 1908 or thereabouts, describing procedures long since obsolete. Details of technic are not adequately described. The historical development of gastro-enterostomy is admirably given; description of the technic is poor. There is a brief discussion of jejunal ulcer; treatment is not discussed. In discussing congenital hypertrophic stenosis of the pylorus, the now almost universally used Rammstedt operation, is incidentally mentioned, but not described. Since the book deals with "nonmalignant affections of the stomach," the omission of malignancy of the stomach and duodenal ulcer are permissible; but such an arbitrary division of these conditions is by no means a logical one, particularly the omission of the subject of malignancy. It will not be generally agreed that the treatment of the peritonitis following perforated gastric ulcer "is that of all peritonitides," since stomach contents are virtually sterile. The book is of value for a general review of the subject; the student would be likely to leave it without a good idea of relative values, because it lacks "shading," or "color."

GYNÄKOLOGISCHE STRAHLENEFFEKTE UND EINE MERKWÜRDIGE ALOPECIE. Von Dr. Karl Neuwirth Vorstand des von der Polizeibehörde in Wien errichteten Wöchnerinnenheimes und Frauenambulatoriums. Paper. Price, 144 marks. Pp. 143. Vienna: Alfred Hölder, 1919.

The author observed a unique case of alopecia following the combined administration of roentgen rays and radium, subsequent to a Ries-Wertheim operation for cancer of the uterus. This alopecia entailed the entire loss of the capillitium, followed by complete return to health within a few months, although no special therapeutic efforts were employed. This case induced the author to make a study of the efficiency and untoward effects of radiotherapy. He reviews the theories concerning the physical action, on the tissues, manifested by therapeutic rays originating in the roentgen-ray tube and also from radioactive substances. He distinguishes in discussing untoward results the immediate effects—*Roentgenkater*—then destructive changes occurring several weeks after treatment, and finally very remote injuries that occasionally make their appearance in the intestine. The causes of those incidents and the means proposed for their prevention are mentioned and discussed. A comparative evalution of roentgen rays versus the rays emanating from radium and mesothorium is attempted in reporting the views of the authors supposed to be authorities on this subject. It is a reference book, written by a man of scientific ability and discrimination, and furnishes a wealth of information to those desiring to orientate themselves with regard to the present status of the theories of radiotherapy.

HANDBOOK OF ORGANIZATION AND METHOD IN HOSPITAL SOCIAL SERVICE. An Outline of Policies as Practiced at The Johns Hopkins Hospital. By Margaret S. Brogden, Chief of Social Service, The Johns Hopkins Hospital. Cloth. $2.50. Pp. 77, with 2 illustrations. Baltimore: The Norman, Remington Company, 1922.

This book has been arranged and compiled from materials that the author accumulated while serving as chief of social service in the Johns Hopkins Hospital. It is virtually a printed reproduction of policies and instructions first issued in loose leaf form for the direction of the workers in her department, and more particularly for the guidance of new workers. It contains such rules and policies as might be evolved out of the experience of any social service department. The book will be of greatest value to the heads of social service departments by affording them the opportunity of comparing their problems and methods with those that have been worked out in the experience of social service workers at the Johns Hopkins Hospital, and recorded by Miss Brogden in her book.

DIAGNOSTIG DER KINDERKRANKHEITEN MIT BESONDERER BERÜCKSICHTIGUNG DES SÄUGLINGS. Eine Wegleitung für praktische Aerzte und Studierende. Von Professor Dr. E. Feer, Direktor der Universitäts-Kinderklinik in Zürich. Second edition. Paper. Price, $2.80. Pp. 307, with 240 illustrations. Berlin: Julius Springer, 1922.

This monograph is especially well illustrated by pictures and charts selected from among the large clinical material of the author. It is written from the standpoint of the differential diagnosis of symptoms of diseases in infancy and childhood, and covers the conditions commonly seen and the more rare ones as well. Under each symptom are described the different diseases during the course of which such localized or general findings may be present.

## Medicolegal

### Not Entitled to Portion of Viscera for Examination

*(Application of Wnuk (N. Y.), 193 N. Y. Supp. 353)*

The Supreme Court of New York, Appellate Division, Fourth Department, says that, after the death of one Henrietta Schieck, petitioner Wnuk alleged that an action was about to be brought against him by the representatives of the decedent to recover damages for her death, on the ground that it was caused by his negligence in an automobile accident; whereas he was informed that her death was caused by inflammation of the liver. Wherefore, he petitioned for, and was granted, an order for the production of portions of the body of the decedent, more particularly the liver, for the purpose of an examination by physicians of the petitioner. There had been a private necropsy, ordered by members of the family, and the liver, which had been removed from the body, which had not yet been buried, was in the possession of an attorney or the surgeon who made the necropsy, for the purpose of having an examination made of it. In reversing the order that was granted, the court holds that the provisions of Section 5-a of the Public Health Law, relied on by the petitioner as a basis for the order, which allow the medical representatives of a person likely to be a defendant in a civil action to be present at certain necropsies, had no application to this case, as that section relates to what may be termed official necropsies; that is, those performed by or under the direction of the coroner. Further, the order in this case is no way related to a necropsy, but to an examination of a portion of the viscera, a matter not covered by the statute. Neither was the order justified by Section 803 of the Code of Civil Procedure, as the discovery there provided for can only be required at the instance of a party to an action, while in this case no action was pending. Although in this instance the organ seemed to have been removed from the body, at least temporarily, it was still a part of the human remains, and as such was to be disposed of as the family might desire. In the absence of a clear right or a statutory command, the courts should not interfere with the relatives' possession or control of the remains or any part of them.

### Percentage of Disability—Examination—Treatment

*(Pocahontas Mining Co. v. Industrial Commission et al. (Ill.), 134 N. E. R. 160)*

The Supreme Court of Illinois, in reversing a judgment that affirmed an award of compensation by the industrial commission for injuries sustained by an employee of the mining company, who suffered burns from an explosion, says that the commission, under the evidence in the case, was required to find as ultimate facts whether or not the claimant had sustained any permanent loss of the use of his arms or eyes, and, if any, what percentage of such loss. This court has frequently ruled that a lay witness, or even an expert, cannot testify in direct terms that an injured employee has lost any stated percentage of the use of an eye or of a limb. It is proper for an injured employee to testify how and in what manner his injuries affect him; and to detail his ability to see or to use his injured parts, his ability to work or to use his injured eyes or limbs, and in what manner such use affects him. It is proper for an expert to testify as to whether or not a man's vision is normal or otherwise, as to the amount or extent of his vision as disclosed by scientific tests or examination, and as to the amount of movability or apparent use he has of an injured limb; but he cannot answer in direct terms as to what percentage of loss he has sustained in the use of an eye or of a limb, as such conclusion or finding must be made by the commission from the legitimate evidence in the record.

A blood test of the claimant showed a syphilitic condition, and the mining company offered to furnish him treatment by a physician, with all expenses of hospital treatment paid, and without charge of any kind to the claimant; an offer which was refused by him. The commission declined to consider the petition of the company to suspend payment of the compensation for failure of the claimant to accept medical treatment tendered him for his injuries, on the ground that, under the rulings of the commission, compensation must be paid up to the filing of such a petition; which was not done. The commission also declined to require the claimant to be examined by the medical director of the commission, or by any physician selected by it, at the expense of the company, or to allow the report of such physician to be incorporated in the record as evidence. But the employer is entitled to a physical examination of his employee by a physician without being compelled to pay the compensation awarded by the commission. Furthermore, the company was entitled to a decision of the commission as to whether or not the claimant should submit to the treatment for his ailments that was tendered; and, if it found that such treatment was reasonably essential to promote his recovery, the commission should have entered an order that he submit to the same, and, in case of his refusal, should reduce or suspend the compensation. It seems to the court that an examination of the claimant by an impartial expert as to his physical injuries and condition, and the expert's opinion on the question of the efficacy of the proposed treatment and its desirability, would be most valuable to the commission in making its decision as to whether the claimant was acting within his reasonable discretion in refusing to submit to such examination and treatment, without having his compensation suspended or reduced.

### Privilege Waived as to Any Physician

*(Fennelly v. Schenectady Ry. Co. (N. Y.), 193 N. Y. Supp. 641)*

The Supreme Court of New York, Appellate Division, Third Department, reverses a judgment for damages for personal injuries that was rendered in favor of the plaintiff, on account of error in the exclusion of the testimony of a physician called by the defendant as a witness after the plaintiff had introduced the testimony of another physician. The court says that the plaintiff sought to prove by his physician certain injuries which were alleged to have been caused when the plaintiff was ejected from one of the defendant's cars. This physician did not examine the plaintiff until three days after the alleged assault. The defendant denied that the plaintiff had suffered any injury whatever, and sought to prove, by the physician at the hospital to which the plaintiff was taken, what he found with reference to the physical condition of the plaintiff on his examination of him the morning after the alleged assault. This testimony was objected to by the plaintiff as privileged, and was excluded. But the refusal of the trial court to permit the physician to state what he found, if anything, in his examination of the plaintiff, was reversible error, irrespective of the question whether the plaintiff had met the burden which rested on him to establish that the privileged relationship of physician and patient existed between the plaintiff and the physician, for the reason that the plaintiff had placed his person before the jury as a basis for damages and had his condition described by his own physician. He thereby waived any privilege, not only as to the physician called by him, but also as to any physician who examined him at about the same time.

## Society Proceedings

### COMING MEETINGS

American Physiological Society, Toronto, Canada, Dec. 28-30. Dr. Chas. W. Greene, University of Missouri, Columbia, Secretary.
Hawaii, Medical Society of, Honolulu, Nov. 19-21. Dr. F. J. Pinkerton, 45-46 Young Building, Honolulu, Secretary.
Isthmian Canal Zone, Medical Association of, Ancon, Dec. 15. Dr. L. S. Chapman, Ancon, Secretary.
Philippine Islands Medical Association, Manila, Dec. 20-22, 1922. Dr. I. Concepcion, College of Medicine and Surgery, Manila, Secretary.
Porto Rico, Medical Association of, Ponce, Dec. 15-17. Dr. Augustin R. Laugier, San Juan, Secretary.
Radiological Society of North America, Detroit, Mich., Dec. 4-8. Dr. M. J. Sandhorn, Appleton, Wis., Secretary.
Society of American Bacteriologists, Detroit, Dec. 27-29. Dr. A. P. Hitchens, Army Medical School, Washington, D. C., Secretary.
Southern Medical Association, Chattanooga, Tennessee, Nov. 13-16. Mr. C. P. Lorenz, Empire Building, Birmingham, Alabama, Secretary.
Southern Surgical Association, Memphis, Tenn., Dec. 12-14. Dr. H. A. Royster, Raleigh, N. C., Secretary.
Western Surgical Association, Minneapolis, Minn., Dec. 8-9. Dr. Warren A. Dennis, Hamm Building, St. Paul, Secretary.

# Current Medical Literature

## AMERICAN

Titles marked with an asterisk (*) are abstracted below.

### American Journal of Anatomy, Philadelphia

September, 1922, **31**, No. 1

Changes in Mammary Gland of Albino Rat (Mus Norvegicus Albinus) During Lactation and Involution. L. M. A. Maeder, Minneapolis.—p. 1.

Histology of Testis from Case of Human Hermaphroditism; Significance of Hermaphroditism in Relation to Question of Sex Differentiation. H. E. Jordan, Charlottesville, Va.—p. 27.

Significance of Prechordal Plate. H. B. Adelmann, Ithaca, N. Y.—p. 55.

### American Journal of Medical Sciences, Philadelphia

September, 1922, **164**, No. 3

*Infection of Gastro-Intestinal Tract in Systemic Disorders: Medical Viewpoint. G. R. Satterlee, New York.—p. 313.

*Id. Surgical Viewpoint. J. W. Draper, New York.—p. 322.

*Id. Neurologic Viewpoint. H. A. Cotton, Trenton, N. J.—p. 329.

Application to Other Institutions of Results of Treatment of Insane in Trenton State Hospital. B. G. Lewis, Trenton, N. J.—p. 338.

*Carcinoma of Esophagus with Perforation of Aorta: Radium Therapy. J. G. Carr and C. W. Hanford, Chicago.—p. 340.

*Studies in Physiology of Gallbladder. L. S. Auster and B. B. Crohn, New York.—p. 345.

Chemical Changes of Blood During Immunization. G. L. Rohdenburg, O. F. Krehbiel and A. Bernhard, New York.—p. 361.

*Biochemical Studies in Disease of Skin. II. Acne Vulgaris. O. L. Levin and M. Kahn, New York.—p. 379.

Clinical Importance of Aseptic Infarction of Kidney. P. W. Aschner, New York.—p. 386.

Study of Vestibular Nerve Function in Myxedema. R. A. Barlow, Rochester, Minn.—p. 401.

*Treatment of Syphilitic Liver and Heart: Therapeutic Paradox. U. J. Wile, Ann Arbor, Mich.—p. 415.

Acute Lung Abscess Treated by Therapeutic Pneumothorax. H. M. Rich, Detroit.—p. 428.

**Infection of Gastro-Intestinal Tract in Systemic Disorders.**—From a detailed study of more than 1,000 chronic intestinal invalids medically treated and of more than 200 similar patients in whom a portion or all of the colon had been removed, Satterlee has come to the belief that many of these patients with severely infected colons will not get well until the diseased portion of the organ is removed together with every other local focus. Medical treatment with vaccines and serums is indicated in every case.

**Id.**—Draper states that colectomy should never be considered until all other local foci have been removed and the patient thoroughly treated from a modern medical standpoint, especially with vaccines and serums. Extensive colon pathology exists in 20 per cent. of all so-called "functional" psychotics. Mental symptoms have been arrested in 28 per cent. of these and improvement has occurred in a large percentage. The mortality of partial (46) and total (31) colectomy in seventy-seven consecutive cases has been 12 per cent.

**Id.**—Cotton is convinced that the psychotic individual harbors multiple foci of infection which often can be located and eliminated only with the greatest difficulty. The so-called functional psychoses are due to a combination of many factors, but the most constant one is the intracerebral, biochemical and cellular disturbance arising from circulatory toxins originating in chronic foci of infection situated anywhere throughout the body and probably secondary disturbances of the endocrine system. The psychoses then, instead of being considered a disease entity, should be considered as a symptom, and often a terminal symptom, of a long continued marked infection, the toxemia of which acts directly on the brain.

**Carcinoma of Esophagus with Perforation of Aorta.**—To the twenty-one cases of esophageal carcinoma with perforation of the aorta or other large vessels reported in the literature another case is added by Carr and Hanford. Necropsy disclosed certain deficiencies in the application of radium therapy. Suggestions are made for more effective technic.

**Physiology of Gallbladder.**—Auster and Crohn are inclined to the belief that the flow of bile originates in the liver and sweeps down the ducts into the duodenum disregarding in main part the gallbladder. Such variations in bile flow and concentration as occur originate in the liver in answer to the various degrees of food stimuli. It does not seem to them that the gallbladder as an active organ enters into the physiology of bile excretion. Certainly it does not seem to have an ejaculatory mechanism or the proper musculature for such a function in the same light as one speaks of the urinary bladder or of the seminal vesicles. The outflow from the gallbladder appears to be in the nature of an overflow incontinence. Under pathologic conditions this organ is capable of great distention, acting at such times as an exhaust vent or safety valve to relieve intraductal pressure. Such a function is complementary to its great capacity to concentrate the bulk of bile by dehydration and inspissation.

**Biochemical Status in Acne Vulgaris.**—The biochemical status of thirty-eight patients with moderate and severe acne vulgaris of from one to fifteen years' duration has been studied by Levin and Kahn. In fifteen cases in which the nitrogen retention products in the blood were investigated no constant defect could be detected. The calcium content of the blood was not increased. Hyperglycemia, or a high normal blood sugar, accompanied more than 50 per cent. of the thirty-four cases studied. The blood sugar curve was normal in all the twenty-three patients who were studied for their carbohydrate tolerance. The renal glucose threshold was decreased in four out of twenty-three patients. A mild form of acidosis was found in about 30 per cent. of the thirty-four patients. Feces from nineteen of twenty-three patients showed carbohydrate fermentation, while only four showed protein putrefaction. The enzymes were excellent in all cases for amylase, were good in all cases save four for protease and were good or fair in all cases for lipase. The metabolic rate seemed to be slightly increased in acne vulgaris. The presence of hyperglycemia and the increased basal metabolic rate seem to point toward dysfunction of the thyroid as a possible causative factor. The following measures have proved valuable in the treatment of this condition: Reduction of the carbohydrates in the diet, gastro-intestinal supervision, administration of alkalies and organotherapy. Thyroid in some cases caused the appearance of increased sympathicotonus and increased the severity of the cutaneous condition; occasionally it seemed to produce involution of the lesions. The administration of ovary, lutein and pituitary has been of benefit in some cases.

**Treatment of Syphilis of Liver and of Heart.**—Although Wile is an ardent advocate of the use of arsphenamin in the treatment of syphilis, he is of the opinion that it should not be used as a routine measure in the treatment of cardiac and hepatic syphilis. When indicated in these two conditions it may be used with reasonable safety in those cases which have responded to a previous administration of mercury and iodid. With everything in its favor apparently, from the extent of the lesion, the shortness of its duration and the general well being of the patient, a case of cardiovascular or hepatic syphilis may well turn out to be one with serious or even fatal sequels. Mercury and iodid are admirably suited for the treatment of cardiovascular and hepatic as well as other forms of visceral syphilis. Their action is slow, and this is desirable. In all cases their use should be combined with the intelligent treatment of the diseased heart. The syphilized liver and heart, in whatever stage of the disease, from clinical experience at least, seem to do better when the process of repair is slow and when no great strain is placed on their normal functioning activities.

### American Journal of Tropical Medicine, Baltimore

September, 1922, **2**, No. 5

Carbon Tetrachlorid as an Anthelmintic. M. C. Hall, Washington, D. C.—p. 373.

*Use of Carbon Tetrachlorid for Removal of Hookworms in Human Beings. G. G. Hampton, New York.—p. 381.

Geographical Distribution of Hookworm Infection in United States, Detected in Army Recruits. C. A. Kofoid, Berkeley, Calif.—p. 389.

*Hookworm Index and Mass Treatment. S. T. Darling, Baltimore.—p. 397.

Graphic Analysis of Certain Factors in Hookworm Control. W. W. Cort, Baltimore.—p. 449.

Influence of Malaria on Circulation. S. R. Roberts, Atlanta, Ga.—p. 463.

Action of Light in Production of Relapse in Malaria. F. R. Whitmore, Washington, D. C.—p. 475.

**Use of Carbon Tetrachlorid for Hookworm Disease.**—Hampton states that one 1.5 c.c. dose of oil of chenopodium gives microscopic cures in from 30 to 50 per cent. of the patients treated, while one 3 c.c. dose of carbon tetrachlorid gives microscopic cures in 90 per cent. of the cases treated and costs only one-tenth as much as chenopodium.

**Eradication of Hookworm Disease.**—In hookworm control, Darling says, it would seem to be strategic to treat by vermicide all the people in a community within as short a period of time as possible so that soil pollution and soil infestation will not continue but be terminated abruptly, and so that there will be no reinfection of those already treated. Hence, mass treatment of entire communities is recommended wherever it is practicable. It is believed that when an entire community is purified of most of its worms by mass treatment within a few days, very few hookworm embryos will be passed to infest the soil, and the latter instead of remaining highly infested, as before treatment, rapidly becomes lightly infested and only light and relatively very harmless infections can result.

## American Review of Tuberculosis, Baltimore

September, 1922, **6**, No. 7

Phthisiogenesis and Latent Tuberculous Infection. E. L. Opie, St. Louis.—p. 525.
*Hereditary Factor in Etiology of Tuberculosis. A. Govaerts, Cold Spring Harbor, N. Y.—p. 547.
*Possible Mode of Transmission of Infection in Tuberculosis. S. J. Shipman and A. G. Foord.—p. 566.
Permanent Pulmonary Effects of Gas in Warfare. J. L. Hankins and W. C. Klotz, Johnson City, Tenn.—p. 571.
Lymph Node Distribution of Experimental Tuberculosis in Guinea-Pig. G. B. Webb, C. T. Ryder and C. T. Olcott, Colorado Springs, Colo. —p. 575.
*Serum Ring Reaction in Tuberculosis. M. A. Smeeton, Kentville, Nova Scotia.—p. 588.
Significance of Roentgenographic Mutations of Lesions of Chronic Pulmonary Tuberculosis. J. B. Amberson, Jr., Loomis, N. Y.—p. 591.
*Juvenile Tuberculosis. J. B. Hawes, Boston.—p. 606.

**Hereditary Factor in Etiology of Tuberculosis.**—Govaerts' study of 214 families, in which 185 tuberculous matings and twenty-nine nontuberculous matings were found, representing 5,629 individuals shows that (1) the different percentages of defective or normal offspring are correlated with the quality of their parents; (2) the defect or taint is carried in the parental gametes. The tuberculous diathesis is not inherited always in the same degree, but in different degrees depending on the gametic constitution of the individual. One fact stands out clearly in these statistics: that is, that a larger proportion of the offspring are nontuberculous when the mother alone shows active tuberculosis than when the father alone shows it. Wherever the paternal stock alone is known to be tainted, more of the children show active tuberculosis than when the maternal alone is known to be tainted. This suggests that a nonresistant sperm is more injurious to the zygote than a nonresistant egg. On the other hand, when one parent alone is tainted or has active tuberculosis, there is nearly twice as much respiratory disease in the offspring when that parent is the mother as when it is the father. Biometric and statistical studies agree in indicating a high correlation in inheritance of tuberculosis between parents and offspring. Govaerts' study shows that the percentage of tuberculous offspring is higher in tuberculous families. In the same surroundings, there is a greater occurrence of tuberculous without than with close contact. This holds for the cases of suspects and respiratory diseases. In the distribution of the offspring according to parental and ancestral combinations, the percentage of the tuberculous increases and that of the nontuberculous decreases with the degree of the ancestral tuberculous influence. There is a parental influence by which the defect is introduced. Thus the defect is doubtless carried by the gametes. The maternal influence is very slight and there is no evidence of a prenatal influence. The variation of tuberculous suspects and respiratory diseases among the defectives indicates the presence of an inherited character, which is the constitutional component called diathesis. Of these there are biotypes. Among the biotypes there are those who are more resistant, less resistant and nonresistant.

**Mode of Transmission of Infection in Tuberculosis.**—Shipman and Foord advise that a tuberculous mate should not kiss his or her consort, nor should a young child be kissed, particularly not on the mouth, because tuberculosis may be transmitted by a healthy person by kissing. The period of infectivity of the noninfected person is at least fifteen minutes. These statements are based on experimental and clinical observations.

**Serum Ring Reaction in Tuberculosis.**—The technic of Krumwiede and Valentine's test for the determination of the pneumococcus types was carefully followed by Smeeton with sputum containing large numbers of tubercle bacilli and homologous serum. In no case, however, was a reaction observed. O. T. was then used in place of the sputum antigen extract with very definite results. The presence or absence of natural complement appears to play no part in the reaction, since the ring formation was noted in both fresh and inactivated serums. While the reaction is well defined and apparently occurs with greater frequency in tuberculous persons than in normal ones, it is evidently not specific. Nor does the test indicate the degree of immunity possessed by the individual; consequently it is of no prognostic value.

**Juvenile Tuberculosis.**—Five diagnostic points have been found useful by Hawes in the diagnosis of bronchial lymph node tuberculosis. (1) A positive skin tuberculin test, unless the child has recently recovered from measles or any of the other acute infections which might lead to a negative test, or unless the child has advanced tuberculosis. (2) A definite history of exposure from either human or bovine sources of tuberculosis. (3) Constitutional signs and symptoms, particularly loss of weight or failure to gain weight, along with "ease of tire" or undue fatigue, fever or rapid pulse. (4) The presence of enlarged bronchial nodes as shown by the roentgen-ray or by clinical examination of the chest. (5) The absence of other evident sources of infection or toxemia, such as, (*a*) infected tonsils or adenoids, (*b*) carious teeth, (*c*) intestinal disturbances and particularly a chronic appendicitis, and (*d*) other possible sources of infection, such as middle ear, lymph nodes in the neck, bronchopneumonia, measles, whooping cough, etc.

## Boston Medical and Surgical Journal

Oct. 5, 1922, **187**, No. 14

Nutrition and Growth in Relation to Tuberculosis. W. R. P. Emerson, Boston.—p. 495.
Special Training in Home Nursing. A. Worcester, Waltham, Mass.—p. 498.
Investigation of Reliability of Laboratory Tests and Discussion of Technic of Laboratories in and Near Boston. F. H. Slack, Brookline, Mass.—p. 500.

Oct. 12, 1922, **187**, No. 15

Some Changes in Medical Teaching and Surgery. C. A. Porter, Boston. —p. 525.
Factors in Dyspepsia. F. W. Palfrey, Boston.—p. 527.
Some Aspects of Problem of Sterility. S. R. Meaker, Boston.—p. 535.
Instrument for Suction, Medication and Massage of Tonsils, and with Uses in General Medicine. J. Taylor, Jr., Worcester.—p. 539.
Investigation of Reliability of Laboratory Tests and Discussion of Technic of Laboratories in and Near Boston. F. H. Slack, Brookline. —p. 540.
*Bone Sarcoma; Prevalence in Massachusetts. E. A. Codman, Boston.—p. 543.
Postmortem Radiography. J. A. Honeij, Boston.—p. 545.

**Prevalence of Bone Sarcoma in Massachusetts.**—Four practical points are brought out by the investigation thus far conducted by the bone sarcoma registry in which Codman is active: (1) That the diagnosis should be made with great caution. (2) That Bloodgood's claim of the benign character of giant cell tumors (erroneously called sarcoma) is confirmed by experience in Massachusetts. (3) That true osteogenic sarcoma is almost always fatal (the rare exceptions being cases in which early amputation is performed). (4) That since only nine living cases could be located in a population of 4,000,000 there are probably only 225 in the whole United States (100,000,000). Another point of considerable interest which has been brought out is the frequency with which amputation has been performed for giant cell tumor. Codman says it should be possible by early diagnosis and complete local excision to save the limb in all such cases. No metastasis need be feared. However, early diag-

nosis is not an easy matter. Even if the surgeon excises tissue, the pathologist must have had special experience with these tumors and even then is occasionally in doubt. Even when the diagnosis of giant cell tumor is quite certain, there will be found occasions when amputation is the wisest course, for the bone may be destroyed to such an extent as to appear incapable of regeneration sufficient for functional use. This conclusion must be made with caution, however, for it is surprising how in certain cases after roentgen-ray treatment the bone has regenerated. The registry has a few cases in which roentgen-ray treatment without help from operation has apparently been effective. It is clear, says Codman, that logically the roentgen ray may be used in a suspected bone tumor, on the ground that surgery has little chance if the tumor is metastatic or a sarcoma, and delay will do no harm if the lesion is benign. This is, perhaps, better reasoning than to cut off all the arms and legs on the ground that now and then a life will be saved, for only six five-year cures are known in the whole United States.

## Illinois Medical Journal, Oak Park

October, 1922, **42**, No. 4

Empyema. J. T. Gregory, Chicago.—p. 253.
Surgical Aspects of Uterine Malpositions. J. A. Pettit, Portland, Ore. p. 258.
Diagnosis and Treatment of Peptic Ulcer and Gallbladder Diseases. D. Deal and C. V. McMeen, Springfield.—p. 261.
Memory Defect of Korsakoff Type, Observed in Multiple Neuritis Following Toxemia of Pregnancy. F. A. Ely, Des Moines, Ia.—p. 263.
Origin of Tracheobronchial Inflammations. J. Niess, Carmi.—p. 272.
Differential Diagnosis of Abdominal Pain. C. S. Salmon, Chicago.—p. 274.
Nephrolysis and Ureterolysis. G. Kolischer, Chicago.—p. 279.
"Evil" of Adenoids in Infants. G. S. Duntley, Bushnell.—p. 280.
Bilateral Blood Staining of Cornea. H. S. Gradle, Chicago.—p. 281.
Rectal Fistula Involving Internal Sphincter Muscles. C. J. Drueck, Chicago.—p. 286.
Prognosis in Radical Cure of Hernia. W. F. Grinstead, Cairo.—p. 287.
Alexia (Cortical Word Blindness) with Agraphia in Child. S. D. Wilgus, Rockford.—p. 291.
Question of Tonsillectomy in Early Childhood. C. J. Swan, Evanston. —p. 295.
Enlarged Thymus. O. Barbour and L. S. Goin, Peoria.—p. 299.

## Journal of Biological Chemistry, Baltimore

September, 1922, **54**, No. 1

*Reliability of Benedict and Folin-Wu Blood Sugar Determinations. F. A. Csonka and G. C. Taggart, Pittsburgh.—p. 1.
Mineral Content of Normal White Rat During Growth. G. D. Buckner and A. M. Peter, Lexington.—p. 5.
*Distribution of Iodin Between Cells and Colloid in Thyroid. IV. Distribution of Iodin in Hyperplastic Thyroid Gland of Dog After Intravenous Injection of Iodin Compounds. H. B. van Dyke, Chicago.—p. 11.
Fermentation of Pentoses by Molds. W. H. Peterson, E. B. Fred and E. G. Schmidt, Madison, Wis.—p. 19.
*Influence of Sodium Ion in Production of Tetany. F. F. Tisdall, Toronto.—p. 35.
Studies of Human Mixed Saliva. I. Determination of Hydrogen Ion Concentration of Human Mixed Saliva. H. E. Starr, Philadelphia. —p. 43.
Id. II. Variations in Hydrogen Ion Concentration of Human Mixed Saliva. H. E. Starr, Philadelphia.—p. 55.
Structure of Fucose. E. P. Clark, Washington, D. C.—p. 65.
Dietary Factors Influencing Calcium Assimilation. III. Comparative Efficiency of Timothy Hay, Alfalfa Hay and Timothy Hay Plus Calcium Phosphate (Steamed Bone Meal) in Maintaining Calcium and Phosphorus Equilibrium in Milking Cows. E. B. Hart, H. Steenbock, C. A. Hoppert and R. M. Bethke, Madison, Wis.—p. 75.
Unsaturated Fatty Acids of Brain Cephalins. P. A. Levene and I. P. Rolf, New York.—p. 91.
Unsaturated Fatty Acids of Brain Lecithins. P. A. Levene and I. P. Rolf, New York.—p. 99.
Possible Asymmetry of Aliphatic Diazo Compounds. III. P. A. Levene and L. A. Mikeska, New York.—p. 101.
Metabolism of Inorganic Salts. I. Organic Ion Balance of Blood in Parathyroid Tetany. E. G. Gross and F. P. Underhill, New Haven, Conn.—p. 105.
Studies of Gas and Electrolyte Equilibria in Blood. I. Technic for Collection and Analysis of Blood, and for Its Saturation with Gas Mixtures of Known Composition. J. H. Austin, G. E. Cullen, A. B. Hastings, F. C. McLean, J. P. Peters and D. D. Van Slyke, New York.—p. 121.
Id. II. Reversibility of Effects of Changes in $CO_2$ and $O_2$ Tensions on $CO_2$ Content of Defibrinated Horse Blood. J. P. Peters, G. E. Cullen and J. H. Austin, New York.—p. 149.

**Reliability of Sugar Determinations.**—Csonka and Taggart assert that the Folin-Wu blood sugar determination gives more reliable results than Benedict's picric-picrate method.

**Distribution of Iodin in Thyroid.**—The findings of Marine, Feiss and Rogoff previously made that the hyperplastic thyroid gland of the dog rapidly binds iodin intravenously introduced as a solution of potassium iodid were confirmed by van Dyke. By a method already described the ratio value of iodin in cells to iodin in whole gland was determined and found to be very low after the intravenous injection of potassium iodid solution into dogs with hyperplastic glands when those glands were removed from 1.5 to 60 minutes after the injection. The ratio value more nearly approached the normal if the interval elapsing between injection and removal of gland was made about twenty-four hours instead of one hour or less as in most of the experiments. When iodin as colloid iodin solution of normal animals was administered intravenously practically none of the colloid iodin was taken up by hyperplastic glands during the periods of time used in these experiments; yet from an injection of a comparable amount of iodin in the form of potassium iodid the ready binding of iodin by similarly hyperplastic glands was proved. Colloid iodin of hyperplastic glands removed one hour after the intravenous injection of potassium iodid solution was taken up to some extent by hyperplastic glands; but these last named glands bound additional iodin as potassium iodid introduced after the colloid iodin injection.

**Influence of Sodium Ion in Production of Tetany.**—The sodium-calcium ratio is believed by Tisdall to be the important factor in the production of tetany, with the exception of the gastric type. Gastric tetany is not due to a disturbance of the sodium-calcium ratio but apparently to an increase of the bicarbonate ion. No evidence has been found that the calcium-phosphorus ratio has any influence on the production of tetany.

## Journal of Infectious Diseases, Chicago

September, 1922, **31**, No. 3

*Factors Controlling Intestinal Bacteria; Effect of Acute Obstruction and Stasis on Bacterial Types. L. R. Dragstedt; P. R. Cannon and C. A. Dragstedt, Chicago.—p. 209.
*Nonspecific Immunity. P. F. Clark, C. E. Zellmer and H. W. Stone, Madison, Wis.—p. 215.
*Complement Fixation in Typhoid Fever. L. G. Hadjopoulos, New York. —p. 226.
Cultivation of Bacterium Abortus Bang. C. P. Fitch, St. Paul.—p. 233.
*Meiostagmin Reaction. W. E. Gouwens, Chicago.—p. 237.
Effect of Urea on Immunologic Reactions. N. P. Sherwood, Lawrence, Kan.—p. 252.
Studies of Hemolytic Staphylococci. L. A. Julianelle, Philadelphia.—p. 256.
Hecht-Weinberg-Gradwohl Test. Studies on Serodiagnosis of Syphilis. L. W. Famulener and J. A. W. Hewitt, New York.—p. 285.
*Mather's Coccus in Throat in Influenza. F. W. Mulsow, Iowa City, Ia. —p. 291.
*Incubation Period of Typhoid. J. R. Miner, Baltimore.—p. 296.
Relative Effect of Certain Triphenylmethane Dyes on Growth of Bacilli of Colon Group in Lactose Broth and Lactose Bile. C. E. A. Winslow and A. F. Dolloff, New Haven, Conn.—p. 302.

**Effect of Intestinal Stasis on Bacterial Types.**—Evidence is presented by Dragstedt et al. which indicates that other factors than the character of the diet are concerned in determining the type of intestinal flora. Either a complete obstruction or a stasis in the passage of the intestinal content results in a proteolytic flora irrespective of the character of the diet. The intestinal secretions do not suppress the growth of gram-negative bacteria in closed intestinal loops. The disappearance of gram-positive aciduric organisms from closed intestinal loops is probably due to the absence of utilizable carbohydrate and to the alkaline reaction of the medium.

**Nonspecific Immunity.**—By the intravenous injections of repeated doses of gram-positive cocci, Clark et al. rendered rabbits more resistant to the injection of a totally unrelated organism, *B. typhosus*. This type of nonspecific vaccination causes the rabbits to respond, when they are subsequently inoculated with *B. typhosus*, by building up a higher concentration of agglutinins against this unrelated antigen than do normal animals when they are kept under the same living conditions.

**Complement Fixation in Typhoid.**—In the course of typhoid infection, Hadjopoulos states, the formation of complement fixing antibodies is one of the earliest and most constant

immune manifestations. The introduction of a differential quantitative, active serum technic for the complement fixation test makes it possible to utilize this property for the diagnosis of typhoid fever, with satisfactory results. In a limited number of typhoid cases the test has been repeated with inactive serum and found similarly satisfactory. It is recommended, however, that the active serum technic be used, as it saves much time in the routine work of the test.

**Value of Meiostagmin Reaction.**—More than 1,100 tests were made by Gouwens in a study of the meiostagmin reaction, using almost 200 different mixtures of rabbit serum and antigen. He found that this reaction does not reveal the presence of antibodies in *B. paratyphosus* B immune rabbit serum of high titer regardless of (*a*) the dilutions in which the serums and antigens are employed, and (*b*) the solvents used in the preparation of the antigens.

**Mather's Coccus in Throat in Influenza.**—A green producing streptococcus resembling the pneumococcus in morphology but insoluble in bile was found by Mulsow to be the predominating organism in an influenza epidemic affecting 75 per cent. of a class of students. The same organism was found as the predominant one in the throats of other students with similar symptoms and in the throats of patients in the hospital with influenza. This coccus grows characteristically on blood agar and uniformly ferments dextrose, levulose, maltose, sucrose, and lactose. In most cases inulin, salicin, and raffinose are also fermented. Dextrin and mannite are not fermented. It is only slightly virulent for mice and rabbits. The relation of this organism to the epidemic is very interesting. For convenience of discussion and because of the early study by Mathers of this organism in relation to influenza, the name of *Streptococcus mathersi* is suggested for it.

**Incubation Period of Typhoid.**—The results obtained by Miner are consonant with the belief that the length of the incubation period depends in part on the virulence of the infection. The means of the epidemics due to infected water are $13.81 \pm 0.83$, $19.38 \pm 1.66$, and $19.50 \pm 0.31$, whereas the means for those due to infected food, in which the dose was probably more massive, are $7 \pm 0.26$ and $9.54 \pm 0.39$.

## Journal of Industrial Hygiene, Boston

October, 1922, **4**, No. 6


Ideal Work Curve. T. Bedford.—p. 235.
Cooling Power of Atmosphere and Comfort During Work. L. Hill and J. A. Campbell, London.—p. 246.
Estimations of Mercury in Hatters' Fur and in Felt. A. S. Minot, Boston.—p. 253.
Study of Mortality of Coal Miners of England and Wales. E. L. Collis.—p. 256.
Medical Examination of Employees. D. A. Coles, London.—p. 273.
Labor Records in Factories. G. M. Broughton.—p. 275.


## Journal of Radiology, Omaha

October, 1922, **3**, No. 10


Bone Diseases, Osteoporosis or Lipomasia from Fixation and Nonuse. J. C. Bloodgood, Baltimore.—p. 403.
Cancer: Its Character and Causes. L. Loeb, St. Louis.—p. 407.
Gallbladder. R. A. Arens, Chicago.—p. 411.
Cecocolic Sphincteric Tract. I. S. Hirsch, New York.—p. 413.
Roentgen-Ray Anthropometry (Skull). A. J. Pacini, Chicago.—p. 418.


## Journal of Urology, Baltimore

October, 1922, **8**, No. 4


Case of Bilateral Pyelitis Due to Bacillus Pyocyaneus: Unusual Kidney Infection Diagnosed Through Ureteral Catheterization. C. P. Mathe and A. E. Belt, San Francisco.—p. 281.
Pathologic Changes in Experimental, Ascending and Hematogenous Pyelitis. H. F. Helmholz, Rochester, Minn.—p. 301.
*Relationship of Blood Concentration to Nitrogen Retention in Experimental Nephritis. F. P. Underhill and R. Kapsinow, New Haven.—p. 307.
*Association of Hypernephroma with Tuberose Brain Sclerosis and Adenoma Sebaceum. A. Hyman, New York.—p. 317.
Extraperitoneal Pelvic Suppuration in Male. L. Herm and B. Stuart, Philadelphia.—p. 323.
Development and Surgical Importance of Rectourethralis Muscle and Denonvilliers' Fascia. M. B. Wesson, San Francisco.—p. 339.


**Blood Concentration and Nitrogen Retention in Nephritis.**—Underhill and Kapsinow found a close relationship in uranium nephritis between the degree of retention of nonprotein nitrogen and creatinin and blood concentration; the greater the retention the more dilute becomes the blood. It is suggested that changes in blood concentration may be employed clinically as an indication of the severity of a nephritic condition; and that this factor, in part at least, is responsible for the anemia observed clinically at times in nephritis.

**Association of Hypernephroma, Tuberose Brain Sclerosis and Adenoma Sebaceum.**—Hyman's patient was a boy, aged 10, who had had convulsions since 2½ years of age. He had been mentally deficient since early childhood, so much so that his parents were forced to remove him from school on account of his inability to keep up with even the lowest grade classes. During the past year he has had peculiar athetoid movements of hands. He has had an eruption on the face for a number of years. The eruption consisted of innumerable tiny pin head sized nodules, from yellowish to dark red in color. Abdominal examination demonstrated a hard nodular mass, the size of a grape fruit, in the right loin. The mass was easily balloted from the loin and was slightly tender on pressure. The rest of the physical examination was negative. Roentgen-ray examination of the urinary tract demonstrated a large shadow which might be a considerably enlarged kidney occupying the entire right renal region. A typical nephrectomy was done. The kidney removed was three times the normal size, very soft and friable, with necrotic infected areas. The pathologic report was hypernephroma.

## Kansas Medical Society Journal, Topeka

October, 1922, **22**, No. 10


False Conceptions Concerning Pulmonary Tuberculosis. J. B. Crouch, Colorado Springs, Colo.—p. 291.
Epidemic Encephalitis. G. W. Robinson, Kansas City, Mo.—p. 297.
Endocrines in Pregnancy. W. E. Stone, Florence.—p. 304.


## Michigan State Medical Society Journal, Grand Rapids

October, 1922, **21**, No. 10


Pericarditis with Effusion. A. F. Jennings and J. E. Delph, Detroit.—p. 419.
American Foot. H. B. Knapp, Battle Creek.—p. 423.
Present Day Syphilis. Inactive and Latent Syphilitic and General Résumé of Treatment. R. C. Jamieson, Detroit.—p. 425.
Modern Views of Cancer. H. C. Saltzstein, Detroit.—p. 429.
Blind Spot. H. S. Gradle, Chicago.—p. 435.
Tuberculosis Laryngitis. B. R. Shurly, Detroit.—p. 438.


## Nebraska State Medical Journal, Norfolk

October, 1922, **7**, No. 10


Roentgen-Ray Treatment of Toxic Goiter. E. W. Rowe, Lincoln.—p. 329.
Medical Aspects of Brain Tumor. G. A. Young, Omaha.—p. 340.
Hematuria as Symptom. A. D. Munger, Lincoln.—p. 342.
Diaphragmatic Hernia. J. R. McKirahan, North Platte.—p. 345.
Acute Abdomen. H. B. Boyden, Grand Island.—p. 347.
Fractures of Radius. W. L. Sucha, Omaha.—p. 349.
Second Rupture of Uterus Complicating Pregnancy. F. B. Young, Gering.—p. 352.
Care of Perineum During Labor, or Plea for Episiotomy. R. Rix, Omaha.—p. 354.
Sclerosing Keratitis Following Uveitis. I. M. Haughey, Aurora.—p. 356.


## New Jersey Medical Society Journal, Orange

October, 1922, **19**, No. 10


Modern Diagnosis and Treatment of Gonorrhea in Male. C. H. de T. Shivers.—p. 268.


## New York Medical Journal and Medical Record

Oct. 4, 1922, **116**, No. 7


*Two Cases of Oriental Sore (Cutaneous Leishmaniosis). H. Fox, New York.—p. 365.
Precancerous Dermatoses. W. J. Highman, New York.—p. 367.
Alopecia and Its Treatment. L. K. McCafferty, New York.—p. 369.
*Pityriasis Rubra Pilaris Associated with Dystrophia Adiposogenitalis. P. E. Bechet, New York.—p. 372.
Diagnosis and Treatment of More Common Diseases of Skin. E. Pisko, New York.—p. 374.
Case of Leprous Keratitis Punctata. M. J. Levitt, Brooklyn.—p. 376.
*Bacteriologic Study of Cutting Oils Causing Skin Lesions. R. C. Rosenberger, Philadelphia.—p. 377.
Value of Roentgen-Ray in Skin Diseases. M. V. Leof, Philadelphia.—p. 379.
Tungsten Incandescent Electric Lamp Used as Therapeutic Agent. F. T. Woodbury, Fort Ringgold, Tex.—p. 382.
Radiotherapy of Cancer. J. T. Stevens, Montclair, N. J.—p. 386.
Roentgen-Ray Treatment of Adenopathies. M. K. Fisher, Philadelphia.—p. 389.

Rhinoscleroma. H. Goodman, New York.—p. 391.
*Case of Spontaneous Gangrene, Simulating Purpura, Due to Acute Thrombo-Arteritis. D. W. Kramer, Philadelphia.—p. 394.
What the Family Physician Should Know About Cancer. C. J. Broeman, Cincinnati.—p. 397.
Dermatology and Nervous System. G. H. Hyslop, New York.—p. 402.
Temple Offerings to Aesculapius. J. Wright, Pleasantville, N. Y.—p. 404.

**Cutaneous Leishmaniasis.**—Fox cites two cases occurring in immigrants from Syria and Persia for the purpose of directing attention to the occurence of this disease in the United States.

**Pituitary Extract in Pityriasis Associated with Adiposogenital Dystrophy.**—Bechet gave his patient pituitary extract (posterior lobe), one-half grain, three times a day. Plain petrolatum was used externally. There was a marked and progressive improvement in both the eruption and the hypopituitary state within a few weeks.

**Bacteriologic Study of Cutting Oils.**—It is a very common thing to observe in those workers in or with oil a condition, either of an acne, a dermatitis or furunculosis. Various factors have been put forward as the causative agent in these conditions. Some have mentioned the irritating properties of the higher paraffin, others have mentioned the presence of the particles of metals, while all mention the personal cleanliness of the workers. Rosenberger asserts that the presence of staphylococci or streptococci in fresh or used oil is exceedingly rare, and therefore the alleged presence of these organisms in freshly made oils should not be accepted as the whole cause of the conditions cited. The addition of antiseptics or germicides to the cutting oils appears to exercise very little, if any, action on pyogenic bacteria in pus, nor is it effective in the prevention of infections of the skin.

**Spontaneous Gangrene Due to Thrombo-Arteritis.**—Kramer cites one case which illustrates the occurrence of an infection of the arteries independent of the general maladies which may be associated with bacteremias and which is usually regarded as a purpura. It is an acute condition with a definite clinical picture. It is presumably caused by some strain of streptococcus, and the point of entrance may be the throat. The lesions in the vessels are varied. The media is most commonly involved. The intima and adventitia, as well as the perivascular tissues, likewise show evidences of inflammation. The clinical picture in the early stage is vague and indefinite so far as a diagnosis is concerned, although it is quite evident that the patient is seriously ill. Later as the blood vessels become more definitely involved, through the direct action of the bacteria or their toxins on the arteries, thrombi are produced with occlusion of the lumen of the vessels or rupture of their walls, and the clinical aspect becomes clearer. Usually the extremities, both upper and lower, are affected. The condition may terminate fatally within a few days or the patient may gradually recover with sloughing of the gangrenous areas, or after surgical intervention.

## Ohio State Medical Journal, Columbus

October, 1922, **18**, No. 10

Infections of Gallbladder and Biliary Apparatus. F. Fletcher, Columbus.—p. 661.
Present Status of Gallbladder and Pancreatic Disease as it Pertains to Etiology, Diagnosis and Treatment. K. Hale, Wilmington.—p. 665.
Diagnosis and Treatment of Asthma and Hay-Fever. M. B. Cohen, Cleveland.—p. 669.
Odors. J. J. Sutter, Lima.—p. 672.
Autonomic Nervous System in Mental Depression. H. D. McIntyre, Marion.—p. 675.
Blood Typing. H. R. Huston, Dayton.—p. 680.
Dacryocystitis: Etiology, Pathology, Treatment, Medical and Surgical. C. S. Means, Columbus.—p. 682.
*Granuloma Inguinale. H. L. Claassen, Cincinnati.—p. 685.
*Precocious Mother: Case Report. M. F. Hussey, Sidney.—p. 689.

**Granuloma Inguinale in Ohio.**—In Claassen's experience granuloma inguinale is not so rare outside the topics as most physicians believe. None of his patients (four) had ever been in the tropics. The peculiar bodies described by Donovan were not constantly present, although they seem to bear an etiologic relationship. The intravenous administration of tartar emetic constitutes a specific form of treatment.

**Ten Year Old Mother.**—Hussey relates the case of a girl, aged 10 years, 11 months and 13 days, whom he delivered of a 6 pound baby. A point of interest mentioned was a ridge the size of a man's arm extending from the pubis to the ensiform cartilage, 2 inches or more to the right of the median line, with a tumor-like projection at the superior point the size of a cocoanut.

## Public Health Journal, Toronto

September, 1922, **13**, No. 9

Function of College in Promoting Mental Hygiene. C. M. Hincks.—p. 385.
Interpretation of Wassermann Test. H. K. Detweiler.—p. 395.
Nostrum and Quack Evil. P. S. Campbell.—p. 400.
Vitamins. A. H. Wright.—p. 411.
Dental Hygiene. H. W. Black.—p. 416.
Victorian Order of Nurses for Canada. I. McMann.—p. 420.

## Rhode Island Medical Journal, Providence

October, 1922, **5**, No. 10

Reminiscences of Surgery for Last Thirty-Six Years. J. J. Baxter, Woonsocket.—p. 319.
Problems of Health Officer. C. V. Chapin, Providence.—p. 322.

## Southern Medical Journal, Birmingham, Ala.

September, 1922, **15**, No. 9

*Procedure for Demonstrating Power of Kidneys to Concentrate and Diurese Normal Constituents of Urine. W. H. Olmsted, St. Louis.—p. 677.
*Case of Sporotrichosis. C. M. Grigsby and R. H. Moore, Dallas, Tex.—p. 684.
*Tartar Emetic in Treatment of Granuloma Inguinale and Other Granulomas and Granulating Ulcers. K. M. Lynch, Dallas, Tex.—p. 688.
*Direct Exposure to Tuberculosis in Infancy and Childhood and Its Relation to Manifest Pulmonary Tuberculosis in Adult. W. M. Taylor and L. J. Moorman, Oklahoma City, Okla.—p. 692.
Case of Hypertrophic Pyloric Stenosis, Complicated with Marked Pylorospasm. H. L. Moore, Dallas, Tex.—p. 699.
Eight Cases of Jaundice. J. R. Snyder, Birmingham, Ala.—p. 703.
Gastro-Intestinal Expression of Sympathetic and Vagotonia. J. B. Fitts, Atlanta, Ga.—p. 705.
Syphilis of Colon. J. P. Keith, Louisville, Ky.—p. 709.
Surgery of Gallbladder with Analysis of Five Hundred and Twelve Cases. W. H. Goodwin, Charlottesville, Va.—p. 712.
*Analysis of One Hundred and Sixty Cases of Osteomyelitis with End Results. J. S. Speed, Memphis, Tenn.—p. 721.
Prostatic Surgery. F. L. Carson and E. L. Yeakel, Shawnee, Okla.—p. 727.
Problem of Chronic Infection of Prostate. A. Nelken, New Orleans.—p. 730.
Treatment of Gonococcal Arthritis in Male. N. Moore, St. Louis.—p. 737.
Amputation of Leg. T. H. Hancock, Atlanta, Ga.—p. 742.
Abscess of Lung: Etiology. H. W. Lyman, St. Louis.—p. 744.
Clinical Course and Diagnosis of Postoperative Pulmonary Abscess. C. L. Minor, Asheville, N. C.—p. 749.
Treatment of Lung Abscess. C. O. Giese, Colorado Springs, Colo.—p. 755.
Choked Discs from Perisinus Abscess: Sinus Normal. J. H. Buckley, Fort Smith, Ark.—p. 762.

**Power of Kidneys to Concentrate and Diurese.**—If the kidney could be forced to concentrate so that with a normal kidney the specific gravity of urine were high, say 1.025 or 1.030, Olmsted says, it might be possible to show that in early nephritis the degree of concentration of the urine or its specific gravity is not so high as in the normal person. And if, after forcing such an early diseased kidney to concentrate, a large amount of water were given, it is conceivable that there would occur an increased washing out of temporarily retained urinary constituents. The method used by Olmsted to force the kidney to exercise a concentrated urine is a twelve-hour fast, during which neither food nor water are taken. The procedure is as follows: After the evening meal at 6 p. m., the patient goes through the night without food or water. Between 6 and 7 a. m. the bladder is emptied as completely as possible. The time of voiding is carefully noted. For three hours more the patient is asked to go without food or water. Exactly three hours after the 6 o'clock voiding the patient voids again. This urine represents a three-hour elimination of the body in a basal state after a twelve-hour fast and thirst. Immediately on finishing voiding of the three-hour concentrated specimen the patient drinks 2½ liters of warm water in the next one and one-half hours. All urine voided for the three hours during and after the drinking of water is collected by noon of the day of the test.

There are two specimens of urine, the one of small volume, from 50 to 200 c.c., and of high specific gravity; the other of large volume, usually more than 1,000 c.c. and of very low specific gravity. Both specimens represent a three-hour basal metabolism. These urines are referred to as the "concentration" and the "diuresis" specimens. Olmsted discusses the normal response of the kidney, the variation in concentration and diuresis in certain types of pathologic conditions and compares the ability of the kidney to concentrate and diurese with other tests of kidney function.

**Sporotrichosis of Lungs and Skin.**—In Grigsby's case, the disease apparently involved the lungs as well as the skin. The organism was easily cultured. In the treatment the measures of value were rest, tonics and high diet. Roentgen-ray, vaccine, neo-arsphenamin, potassium iodid, mercury and arsenic were all of very little use. Silver nitrate, in 10 or 15 per cent. solution, applied often to the skin lesion, was most helpful of all.

**Tartar Emetic in Granuloma Inguinale.**—The three cases cited by Lynch failed to improve before the tartar emetic administration and did improve very materially under it.

**Exposure to Tuberculosis in Childhood Causes Disease in Adults.**—In the opinion of Taylor and Moorman there seems to be a definite relation between childhood exposure and manifest pulmonary tuberculosis in the adult as shown by the fact that routine history taking showed childhood exposure in 62 per cent. of 200 cases. They believe there must be many periods of mild tubercle toxemia between the date of infection and the discovery of clinical disease, and that many cases of so-called malnutrition, nervous instability, malaria, anemia and undetermined fever may be the result of toxemia.

**Results of Osteomyelitis Treatment.**—The records in Speed's series do not favor the complete subperiosteal reaction of the tibia, radius or ulna, even when practically the entire shaft is involved. Any loss of continuity in the shaft of the long bones is to be avoided if possible. Defects of as little as one-half inch, cause marked prolongation in the period of disability. Simple fractures through the involucrum have all united much as ordinary bone does. Continuity of the bone was broken in sixteen cases of this series; fourteen cases in the tibia and one case each in the ulna and radius. The ulna completely regenerated and there is still bony deficiency in the radius after fifteen years. In only four, or about 29 per cent., of the tibial cases did complete regeneration take place. In all of the cases in which the after-treatment could not be supervised there was some shortening and bowing deformity in the leg. Transplantation of the fibula and bone grafts between the ends of the tibial fragments was necessary to give a stable leg. Permanent deformities requiring operative treatment for the improvement or cure were apparently much more frequent following osteomyelitis than is generally reported, occurring in 30 or 27.3 per cent. of 110 chronic cases.

## Southwestern Medicine, Phoenix, Ariz.

October, 1922, **6**, No. 10

*Mental Hygiene in Arizona. T. H. Haines, New York.—p. 351.
Injuries to Face and Jaws. W. T. Coughlin, St. Louis.—p. 356.
Infantile Spastic Paralysis. R. D. Kennedy, Globe, Ariz.—p. 360.
Roentgen Ray of Heart. R. G. Karshner, Los Angeles.—p. 362.
Relation of Nasal and Accessory Sinus Disease to Bronchial Asthma. J. J. McLoone, Phoenix, Ariz.—p. 367.
Value of Blood Chemistry to Practitioner. P. B. Newcomb, Tucson, Ariz.—p. 371.

**Mental Hygiene in Arizona.**—Haines reports the findings made by the Arizona Mental Hygiene Survey in its examination of about 9,000 children in ten counties of the state and also of some of the least desirable families in Arizona. Some of them are delinquents, some are dependents, some are feebleminded, and some are psychopathic. In every case, however, the mental condition is shown to be the fundamental cause of the dependency or of the delinquency, and that this cause is more or less hereditary in character, so that the family as such is to be classed among the undesirable, the unfit, and, therefore, suitable for elimination. Haines points out that it is a part of wisdom to work out means of managing such families, not only for the present minimizing of the expense to which they put the public, but to minimize and ultimately eliminate the expenses for such stocks in the state.

## West Virginia Medical Journal, Huntington

October, 1922, **17**, No. 4

Progress of Medical Education at West Virginia University Since 1921. J. N. Simpson, Morgantown.—p. 121.
Driven or Driver. J. H. Anderson, Marytown.—p. 124.
Hallux Valgus. J. A. Guthrie, Huntington.—p. 142.
Acute Gonorrheal Epididymitis. E. W. Strickler.—p. 144.

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## FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## British Journal of Tuberculosis, London

October, 1922, **16**, No. 4

*Alpine Climate: Physiology and Therapeutics. B. Hudson, R. G. Bannerman and T. N. Kelynack.—p. 153.
Leysin Revisited. C. W. Saleeby.—p. 181.
Impression of Work of Section of Tuberculosis at Glasgow Meeting of British Medical Association. A. S. M. MacGregor.—p. 185.

**Alpine Climate in Tuberculosis.**—The authors endeavor to show that great benefit is to be derived in certain cases of tuberculosis from residence in the thin, pure, dry and invigorating air of the Swiss Alps. Patients in the stages of a suitable type of the disease when sent straight to the Alpine climate and kept there for a long enough period almost invariably make extraordinarily quick and stable recoveries. An average sojourn should not be for less than six months, and, better still, it is wise to devote one year, or even more, with periods of change of environment, when necessary, to securing arrest of the trouble. In the Alps a large number of second and third stage patients who have tried to get well elsewhere, without success, receive great benefit.

## China Medical Journal, Shanghai

September, 1922, **36**, No. 5

Surgical Problems and Difficulties in Tropics. D. J. Harries.—p. 385.
Five Cases of Fasciolopsis Infection. A. F. Cole.—p. 391.
Several Cases of Rare Forms of Subconjunctival Granuloma. F. H. Judd.—p. 397.
Technic for Staining Ameba with Iron Hematoxylin. C. A. Kofaid.—p. 406.
Epidemic Encephalitis. C. McA. Wassell.—p. 410.
Case of Epidemic Encephalitis. G. S. Shibley.—p. 418.

## Edinburgh Medical Journal

October, 1922, **29**, No. 4

Sthenic Dyspepsia—"Hyperchlorhydria." J. J. G. Brown.—p. 161.
Passage of Latchkey Through Intestinal Canal. H. A. Lediard.—p. 213.

## Indian Medical Gazette, Calcutta

September, 1922, **57**, No. 9

Some Economic Aspects of Bengal Malaria. C. A. Bentley.—p. 321.
Problem of Kala-Azar. F. P. Mackie.—p. 326.
*Causation of Epidemic Dropsy. H. W. Acton.—p. 331.
*Surgical Aspects of Amebiasis. K. K. Chatterji.—p. 333.
Cataract Extraction with Iridotomy. R. P. Ratnakar.—p. 337.
Flavine as Therapeutic Agent. P. Ganguli.—p. 338.
*Case of Liver Abscess Which Had Ruptured Into Abdominal Cavity. E. C. C. Maunsell.—p. 340.
Case of Retroperitoneal Hemorrhage. E. C. C. Maunsell.—p. 340.

**Cause of Epidemic Dropsy.**—The peculiar distribution of epidemic dropsy among the middle class Bengali Hindus, whose main article of diet consists of seasoned rice, Acton asserts, indicates that the poison is formed during the seasoning process of rice. The seasoning is probably due to bacterial invasion of the fruit, and is more apt to occur in polished rice, where the fruit is injured during the milling, and during the monsoon months, owing to temperature and humidity. The high price of foodstuffs leads to hoarding of the rice in hot, damp godowns, when the decomposition products are allowed to go still further, and give rise to toxic bodies. The etiologic evidence distinctly incriminates seasoned rice which if allowed to over-ripen gives rise to certain poisons causing epidemic dropsy. The cause and prevention of the disease are obvious, viz., the elimination of seasoned rice from the diet.

**Surgical Treatment of Amebiasis.**—In treating a fairly large number of cases some of which were in an advanced stage, Chatterji has departed from the more orthodox method of surgical treatment and devised methods which have yielded better results, and considerably reduced postoperative mortality. These are: (1) Aspiration and irrigation. (2) Evacuation and drainage by open operation and daily application of Klapp-suction apparatus, for small abscesses bulging anteriorly. (3) Evacuation and drainage by continuous irrigation and use of Klapp-suction apparatus whenever possible for abscesses bulging in the costal spaces laterally.

**Rupture of Liver Abscess.**—Although general peritonitis developed in Maunsell's case as the result of rupture of the liver abscess, the patient survived. On the third day the abdominal tympanites had completely disappeared. There was tenderness over the liver, between the sixth and seventh ribs in the anterior axillary line. A hypodermic needle passed withdrew typical amebic abscess pus, and under local anesthesia an incision was rapidly made, a tube inserted and the contents of a large abscess evacuated. This second abscess had no relation to the first.

## Lancet, London

Sept. 30, 1922, **2**, No. 5170

Future of Hospitals. H. J. Waring.—p. 697.
Fibrous Diathesis and Malignancy of Fibrous Tissue. E. S. Reynolds.—p. 702.
Rapid Digitalis Effects by Oral Administration. F. R. Fraser.—p. 703.
Ophthalmic Progress in Egypt. A. F. MacCallan.—p. 705.
Trachoma in Palestine. I. Ticho and I. J. Kligler.—p. 706.
Cascade Stomach: Two Cases. J. H. D. Webster.—p. 707.
Dormant Filarial Infection. K. Playfair.—p. 709.
Case of Rupture of Cord During Forceps Delivery. W. E. Lee and J. S. Leslie.—p. 709.
*Case of Carcinoma Mammae. G. H. Colt.—p. 710.

**Carcinoma of Both Breasts with Thirty Year Interval.**—In Aug. 30, 1890, a woman, aged 35, was operated on for carcinoma of the right mamma. In 1915, the patient remembered that this tumor of the right breast had been noticed for a year before her third child was born, that the child was 11 months old at the time of the operation, and that she had suckled it from both breasts until a week before. The swelling was "a good big one." In August, 1915, the patient noticed a painless nodule in the left breast, with a hard mass of glands in the left axilla. The supraclavicular glands on the left side were palpable, being discrete and shotty. There was a sound scar, supple and healthy, extending from the middle of the right axilla downward and forward for a distance of 7 inches, and there was no sign of the nipple or of mammary tissue in this region. The pectoralis major was present. There was no axillary or supraclavicular enlargement on the right side and no evidence of visceral disease. In October, 1915, Colt removed the left breast and axillary contents with a wide area of skin and a wider one of deep fascia, together with both pectoral muscles. The supraclavicular glands were not removed. The pathologic report was "spheroidal cell carcinoma with extensive infiltration of the axillary glands." In July, 1919, a colleague removed a recurrence from over the left fifth rib. In January, 1920, the left supraclavicular glands were apparently in the same condition as originally noted in 1915. In July, 1921, there was a hard mass about half an inch across, situated in the middle of the original scar of the operation on the right breast, nearly thirty-one years before. Another small, hard mass was felt in the right axilla. The right supraclavicular glands were not enlarged, but the left glands were larger and softer than before. There was no local recurrence on the left side. Thereafter there was little change externally, but signs of right pleural effusion developed and the patient died in October, 1921, aged 66, more than thirty-one years after the operation on the right breast, and six years after the operation for carcinoma of the left breast. There was no postmortem examination. In the absence of definite information as to the nature of the original tumor in the right breast and in view of the appearance of the nodules in the original scar (right) late in the course of the disease of the left breast, it seems to Colt that these nodules were embolic in origin, the emboli having been arrested where the lymphatic tissue was interrupted by the old scar.

## Medical Journal of Australia, Sydney

Sept. 16, 1922, **2**, No. 12

Puerperal Infection: Its Prophylaxis and Treatment. W. T. Chenhall.—p. 317.
Indications for Cesarean Section. C. E. D'Arcy.—p. 322.
Prematernity Work. J. C. Windeyer.—p. 325.

## Practitioner, London

October, 1922, **109**, No. 4

Common Errors in Treatment of Rectal Conditions. P. Lockhart-Mummery.—p. 269.
*Sudden Death from Cardiac Failure in Diabetes Mellitus. R. T. Williamson.—p. 279.
Duodenal Ulcer. C. Rowntree.—p. 283.
Treatment of Aural Sepsis in Adults. W. Stuart-Low.—p. 290.
Ear, Nose and Throat Complications of Influenza. G. S. Hett.—p. 298.
Recent Public Health Work. J. Priestley.—p. 306.
Cortical Epilepsy Excited on a Damaged Cortex by Peripheral Trauma. G. Robertson.—p. 320.
Successful Treatment (Peptone Injections) of Case of Longstanding Epilepsy. G. R. Hull.—p. 325.
Diathermy in Treatment of Pulmonary Tuberculosis. P. Hall.—p. 328.

**Death from Heart Failure in Diabetes Mellitus.**—Sudden cardiac failure has ranked third among the causes of fatal termination in diabetes in Williamson's experience. Fifty-nine patients died of diabetic coma ("acidosis"); seventeen died of phthisis, and in seven sudden cardiac failure supervened. Other causes of death were less frequent. In all of the heart cases there was no previous sign of valvular disease, no edema, no cyanosis, and the termination was apparently due to failure of the cardiac muscle ending in sudden death.

## South African Medical Record, Cape Town

Sept. 9, 1922, **20**, No. 17

Problem of Examination of Labor Recruits in Transkeian Territories. R. H. Welsh.—p. 323.
*Leiomyoma of Esophagus. E. A. Grunberger.—p. 325.
New Landmarks in Public Health. A. J. Orenstein.—p. 327.
Public Ill-Health. J. A. Mitchell.—p. 328.
Action of Vaccines. J. Pratt-Johnson.—p. 328.
Hospital Control. R. P. Mackenzie.—p. 329.

**Leiomyoma of Esophagus.**—The roentgen ray in Grunberger's case disclosed a very marked stricture of the esophagus just below the manubrium sterni, just allowing a thin stream of the bismuth to pass through, but there was no sign of a tumor. The esophagoscope disclosed a normal and healthy-looking mucous membrane, which at a distance of about 20 cm. from the teeth bulged into the lumen, giving the impression that a round smooth object pressed on the lumen from the front toward the back, and from left to right. This bulging swelling was hard, and could not be pressed away with the esophagoscope, and even the thinnest probe could not be passed down alongside it. The manipulation with the esophagoscope had a very beneficial effect, for the next day the patient could swallow solids for the first time in four months. The patient kept on improving for several weeks; after that, however, the condition gradually became worse again, and after some weeks had become so bad that not even fluids would pass the narrowed esophagus. Gastrostomy had to be performed, but the patient died some days after the operation. The postmortem cleared up the condition. The esophagus was taken out of the body as a whole. It was thicker than usual, and not adherent to the surrounding tissues. No swollen glands were found. Except at the upper section of the esophagus, its wall gave the impression of containing fairly hard masses, not quite evenly distributed, but more pronounced at certain levels than at others. The mucous membrane was normal over the whole length. Microscopic sections through the more normal parts of the esophagus showed some hypertrophy of the muscular coat, but no unusual elements. In the thickened parts the picture was that of a leiomyoma.

## Tubercle, London

October, 1922, **4**, No. 1

Physiologic Adjuvant (Restricted Breathing) in Rest Cure of Pulmonary Tuberculosis. S. A. Knopf.—p. 1.
Heart in Connection with Work of Welsh National Memorial Association. G. A. Stephens.—p. 7.
Low-Tension Pneumothorax. Gwerder.—p. 13.

## Annales de Médecine, Paris

August, 1922, **12**, No. 2

*Pathologic Physiology of Gout. M. Labbé.—p. 81.
*Relations Between "Scrofula" and Tuberculosis. S. Livierato.—p. 93.
*Action of Artificial Pneumothorax. E. Leuret et al.—p. 110.
*Epinephrin Tests. D. Danielopolu and Carniol (Bucharest).—p. 127.
Myoclonia. H. Roger.—p. 150.

**The Pathologic Physiology of Gout.** — Labbé reports research which seems to show that eating meat closes the kidneys to uric acid in the gouty. This tendency to retention is the exaggeration of what occurs rudimentarily in the healthy, and manifestly in the obese and in persons inclined to chronic Bright's disease, and to diabetes. It is so pronounced and so constant in gout that it can sometimes be utilized for differentiating gout from other painful affections. Retention of uric acid is not the only factor in gout. There is, besides, a special tendency to precipitation of uric acid, and cartilage seems to attract this precipitation. Van Loghem suggests that the abundance of sodium salts in cartilage renders the urates less soluble so that they drop out of the blood. Labbé regards the attack of gout as a crisis of urate precipitation induced by some sudden change in the colloidal state of the body fluids. There seems to be some physico-chemical upset, like that in anaphylaxis.

**Influence of "Scrofula" on Tuberculosis.**—Livierato does not agree with those who think that attenuated tuberculosis of the lymphatic glands predisposes to pulmonary tuberculosis. The results of his experimental and clinical research testify directly to the contrary. An extract of tuberculous lymph glands and extracts of scrofulous glands from children had a decided protecting influence when injected into animals. There seems every reason to assume that the extracts of scrofulous glands contain special antibodies against tuberculous antigens. He obtained extract of the tuberculous glands from 20 guinea-pigs and experimented with it in two sets of 8 guinea-pigs injected before or after they were inoculated with tuberculosis, and another group of 4 controls. In the second series of researches, four sets of 9 guinea-pigs each were treated either with extract of guinea-pig tuberculous glands or human scrofulous glands or an extract of normal glands from the calf. In addition to these researches, the complement fixation reaction was investigated in the extracts of scrofulous glands. Hemolysis was complete in all the tubes except in those containing the extract of human scrofulous glands.

**Artificial Pneumothorax.**—The title of this article in the original is "New Data on Artificial Pneumothorax." The writers emphasize the great difference in the effect according as the lung is merely held in repose or is actually compressed. They emphasize that the amount of gas insufflated is no criterion as to the amount of compression exerted by it. The intrapleural pressure is the only gage for this. An illustrated description of the simple apparatus they advocate for this is given, and a number of charts recording the effectual intrapleural pressure from among 300 patients. The clinical findings were supplemented by research on animals. All the evidence testifies to the advantages of resting the lung. Actual compression of the lung should be reserved for cases in which function is entirely lost and no parts of the lung are left that have to be spared.

**Epinephrin Tests.**—The tests were made by the vein; the blood pressure, the pulse, the plethysmographic findings and the subjective sensations were systematically recorded. The epinephrin was injected in the dose of 1 c.c. of a 1:100,000 solution, reducing gradually to 1:1,000,000 or increasing to 1:20,000 according to the results observed. Physiologic saline was the vehicle. Injected subcutaneously, resorption is too variable for any dependence on the findings. A number of charts and tables are given from twenty supposedly healthy persons tested in this way. This research supplements previous work by the same writers with atropin, physostigmin and calcium chlorid. They assert that with these four tests we obtain instructive oversight of the functioning of the involuntary nervous system. It throws an entirely new light on the therapeutic use of drugs, and explains the difference in the reaction to drugs in health and disease.

## Archives Franco-Belges de Chirurgie, Brussels

May, 1922, **25**, No. 8

Results of Osteoperiosteal Grafts. H. Delageniere.—p. 673.
Multilocular Cystic Osteitis of Humerus. E. Sorrel.—p. 719.
Fracture of Surgical Neck of Scapula. Ferry and Ortscheit.—p. 726.
Deep Contusion of the Hip Joint. Caraven.—p. 738.
Central Luxation of Head of Femur. H. L. Rocher.—p. 746.
*Heterotaxia. G. Michel and Mathieu.—p. 753.
Apparatus for Congenital Bilateral Luxation. L. Delrez.—p. 761.

**Heterotaxia.**—Michel and Mathieu report a case of inversion of the viscera in a woman of 26 with gallstone cholecystitis on the left side. Death occurred eight days after surgical intervention. They warn that it is important to remember such anomalies during examination of the thoracic or abdominal viscera. The beating of the heart on the right side should not be mistaken for an aneurysm of that organ or of the aorta. Congenital dextrocardia should not be mistaken for pleuritic dextrocardia, and the liver on the left side should not be taken for hypertrophy of the spleen. Radioscopy clears all doubts.

## Archives de Médecine des Enfants, Paris

September, 1922, **25**, No. 9

*Tuberculids in Child. G. Salès.—p. 513.
Tuberculous Bronchial Glands. J. Belot.—p. 537.
Astasia-Abasia in Girl of Thirteen. J. Comby.—p. 543.
Empyema in Young Children. J. Comby.—p. 548.

**Tuberculids in Child of Two.**—The necrotic papules were followed by fatal miliary tuberculosis. Inoculation of guinea-pigs with scraps from the tuberculids gave a positive response.

## Gynécologie et Obstétrique, Paris

August, 1922, **6**, No. 2

*Ovarian Tumors. P. Masson.—p. 81.
*Evolution of Hysteromyomectomy. D. de Ott.—p. 106.
*Chorio-Epithelioma. Potocki and A. Lelièvre.—p. 112.

**Ovarian Tumors.**—Masson gives fifteen photomicrograms to show the great variety of tumors that may be encountered in the ovaries, aside from teratomas. They may originate in the germinative tissue—in which case they seem to be always malignant—or in the interstitial, excretory or connective tissue, and each type of tissue may develop several forms of neoplasms.

**Evolution of Hysteromyomectomy.**—De Ott remarks that the mortality of ovariectomy was at first so high that it was styled "a necropsy on the living woman." Nowadays the mortality is only 2 or 3 per cent., and the mortality from operative treatment of uterine myomas is even less than this. In his 1902 operations for fibromyomas the mortality by the abdominal route since 1895 has been reduced from 15 to nearly 5 per cent., and by the vaginal route, from about 4 per cent. to nearly zero. Since 1913, in his 11 cases of conservative myomectomy by the vaginal route, the mortality was 9.09 per cent., but it was only 0.6 per cent. in the 323 cases in which the uterus was completely removed, cutting out the fibroma in parts when it was unusually large—*morcellement*. Since 1918 there have been no fatalities from this cause, and only a total of 3 since 1913. In short, he concludes, he has cooperated in the evolution of hysteromyomectomy by the vagina which saves all but less than 1 per cent. of the women.

**Chorio-Epithelioma.**—In the case here reported, the malignant chorio-epithelioma had followed expulsion of a hydatidiform mole in the woman of 43. Necropsy revealed metastases in lung and vagina. The metastasis in the lungs had dominated the clinical picture, and thus misled the diagnosis until too late.

## Paris Médical

Aug. 19, 1922, **12**, No. 33

*False Peritoneal Reactions. E. Gelma.—p. 165.
*Diphtheric Paralysis in Tabes. M. P. Weil and J. Hutinel.—p. 169.
*Arsphenamin By-Effects. H. Mouradian.—p. 172.
Special Syndrome in Epidemic Encephalitis. P. Cantaloube.—p. 176.

**False Peritoneal Reactions.**—Gelma classifies the abdominal psychoneuroses with extremely diverse symptoms but no appreciable organic lesion. They obey the laws of neuropsychopathic conditions, which used to be all labeled hysteria. The pains and fever may suggest peritonitis from appendicitis, but in reality they have nothing to do with the peri-

toneum. The soil is always emotional or hysteric, and these cases of "peritonism" belong in the hands of the psychiatrist, not the surgeon. In one case, the imposing train of symptoms, pain, fever, distress, followed an injection in the right flank of 250 c.c. of sea water. The patient was a man of 42, healthy except for periods of extreme depression and irritability, and he had worried about the absorption of this fluid. The pseudoperitoneal reaction subsided the following day, and three more injections at other points were borne without further disturbance. In a second case the young man presented symptoms suggesting chronic peritonitis, the abdomen enormously distended and sagging, diarrhea alternating with constipation. The rapid recovery under psychiatric measures confirmed the psychopathic origin. The pains in these cases of peritonism are sensory hallucinations, independent of any emotional association. They are experienced by the subject as if they were normal sensory phenomena. They may be elicited by some organic "thorn," but may occur from merely some slight peripheral stimulus. Fever, in itself, does not imply an organic element. The thermometer reading may vary under the influence of emotions just as the galvanometer findings may vary under emotional influences. Moral suasion is futile, and narcotics are especially dangerous in these cases as breeding addiction. The peritonism is usually briefly transient, yielding to bed rest, warmth and isolation.

**Diphtheric Paralysis Plus Tabes.**—The diphtheria had roused and speeded up the tabes in the man of 35, while the tabes had prepared the soil for the diphtheria to attack the nervous system with special gravity.

**Nitritoid Disturbances After Arsphenamin.**—Mouradian declares that restoring conditions to normal in the constipated, the dyspeptic and those with chronic bowel trouble, will ward off the by-effects of arsphenamin treatment. Subjects in this class are especially liable to nitritoid crises, as he shows by seven cases.

Aug. 26, 1922, **12**, No. 34

*The Vitamins. A. Lumière.—p. 181.
*The Cells in the Duodenal Juice. J. Hatzieganu.—p. 185.
General Anesthesia for Opetations on the Nasopharynx. J. Tarneaud.—p. 188.
Success of Serotherapy in Pneumococcus Pneumonia Epidemic. B. Ballet.—p. 192.

**The Vitamins.**—Lumière classifies vitamins in two great groups: One group serves to stimulate the glands with an external secretion. The other group is indispensable for the formation of the specific colloids of the cells. The requirements vary with the species. He says that as we do not know the substances which are indispensable, it is wise to have a great variety in the food so that the necessary vitamins will certainly be found in the diet.

**The Cytology of the Duodenal Juice.**—The cells in the duodenal juice throw light on inflammatory processes in the biliary passages.

## Revue Franç. de Gynécologie et d'Obstét., Paris

July, 1922, **17**, No. 7

*Labor Contractions in the Surviving Uterus. P. Balard.—p. 369.
*High Blood Pressure with Gonad Insufficiency. P. Zénope.—p. 401.
Bistouri with Interchangeable Blades. P. d'Avenas.—p. 406.

**Labor Contractions in the Surviving Uterus.**—Balard reviews the methods and results of study of the functioning of isolated organs under various influences. The uterus seems to possess in itself means to regulate its own functioning. In animals, the uterus may pass through the whole gestation process after the spinal cord has been severed or the nerves of the uterus divided. Pregnancy can occur and proceed apparently normally in women with paraplegia only that the expulsion phase is defective as the woman is unable to strain. This insufficiency of the abdominal muscles calls for artificial delivery. This automatism of the uterus explains postmortem deliveries a few instants or hours after the heart has stopped beating. He noted himself in a case of postmortem cesarean section, half an hour after the woman's death, that the walls of the uterus retracted the same as in the living subject. He gives illustrations of a case in which the uterus, six months and a half pregnant, was removed with a huge fibroma. The woman was in labor but the cervix was not dilated. A 1 cm. snip with the scissors allowed the fetus to be seen through the 3 cm. opening as the uterus with its adherent fibroma lay on a tray for twenty minutes. The uterus muscle continued its tonic and clonic contractions, the same as observed in the surviving uterus, and by the end of the eighth hour the head and the left arm of the fetus had been spontaneously expelled. If anatomic conditions permit, delivery can sometimes be induced by the natural route when the parturient has just died, as the aid of the uterus can usually be counted on for easy and rapid delivery.

**High Blood Pressure from Insufficiency of the Genital Glands.**—Zénope has been impressed with the close relations between the ovaries or testes and the blood pressure. The latter is in inverse proportion to gonad functioning. When the menses are comparatively insignificant, the blood pressure is high, and vice versa. The sphygmonamometer can thus reveal conditions in the genital sphere. His theory is that when the ovaries or testicles are functioning below par, thyroid function is speeded up to compensate, and this raises the blood pressure, while treatment with ovary or testicle extract reduces it.

## Revue Médicale de la Suisse Romande, Geneva

August, 1922, **42**, No. 8

Relation Between Chemical Constitution and Physiologic Action of Organic Compounds. A. Oswald.—p. 481.
*Odium Albicans in Stomach Contents. G. G. Moppert and J. Kagan.—p. 505.
Present Status of Protein Therapy. S. Katzenelbogen.—p. 510.
*Rôle of Body Lesions in Traumatic Neuroses. A. Chelmonsky.—p. 529.

**The Thrush Fungus in the Stomach.**—Moppert and Kagan insist that *Odium albicans* is a saprophyte of the stomach. The slightest obstacle to normal evacuation favors its proliferation. It was cultivated from the stomach content in 53 per cent. of thirty cases of ulcer; in 93 per cent. of twenty-nine with cancer; in 67 per cent. of forty-eight with other pathologic conditions, and in 50 per cent. of six normal subjects.

**Physical Injuries and Traumatic Neuroses.**—Chelmonsky states that persons with grave bodily injury from trauma, such as the loss of a leg or arm, etc., very seldom present symptoms of neurosis. As a rule those actually crippled by an accident never develop a traumatic neurosis or it is insignificant. It seems plausible to admit that serious bodily injury protects the injured to a certain extent against traumatic neuroses: They know positively that their disability entitles them to an indemnity and they do not have to worry about money damages.

## Schweizerische medizinische Wochenschrift, Basel

July 27, 1922, **52**, No. 30

Sprains of Large Joints. C. Kaufmann.—p. 737. Conc'n No. 31.
*The Urine Test for Tuberculosis. E. Stiefel.—p. 746.
Treatment of Placenta Praevia. A. v. Reding.—p. 748.
Early Movements, Reflexes and Muscular Reactions of the Fetus. M. Minkowski.—p. 751. Conc'n.

**The Wildbolz Urine Test for Tuberculosis.**—Stiefel applied Wildbolz' technic in 400 cases of tuberculosis, parallel with the Mantoux intradermal tuberculin test. The results seem to confirm the value of a negative response as excluding active tuberculosis. Positive reactions are not conclusive.

Sept. 14, 1922, **52**, No. 37

*Recurrence of Goiter. J. Dubs.—p. 901. Conc'n No. 38, p. 931.
Mammary Cancer. A. Jentzer.—p. 908.
Paraganglioma of Organ of Zuckerkandl. M. Hausmann and S. Getzowa.—p. 911. Conc'n.
Psyllium Seeds as a Laxative. M. Brot.—p. 918.
Movable Retrodisplacement of the Uterus. Michalski.—p. 918.

**Operations for Recurrence of Goiter.**—Dubs relates that 6.2 per cent. of his 840 goiter operations were for recurrence. He tabulates the data from 26 cases in which paralysis of the recurrent laryngeal nerve followed the operation. He has the patient use his voice at each ligature, each clamping and each resection, and in this way was able to determine the exact cause responsible for the paralysis in all but 5 of the cases. In one patient the paralysis was bilateral, although the intervention had been on one side only. Reexamination later of 17 showed persistence of the paralysis in 11 and complete recovery in 4, with slight paralysis in 2. Recur-

rence of the goiter after resection was known in 55.2 per cent. of 255 cases reexamined later, and in half of the recurrence cases there were more or less serious disturbances. The interval before the recurrence developed was from one to twenty years; twelve years in 7 of the cases, and the interval was from six to twelve years in the 7 cases in which a second recurrence called for an operation. Such experiences urge the necessity for systematic iodin prophylaxis after goiter operations, at least in certain endemic foci. Conditions are much the same with goiter and with gastric ulcer: the cause still persists after excision of the lesion.

## Riforma Medica, Naples

July 24, 1922, **38,** No. 30

Syphilitic Fever. A. Zuppa.—p. 697.
Sources of Error in Friedlander Test for Urea. Alessandri.—p. 699.
*Operative Treatment of Varicose Veins. M. Balsamo.—p. 701.
*Enterostomy in Peritonitis. G. Marchetti.—p. 702.
Tuberculosis of Pelvic Girdle. E. Aievoli.—p. 705.

**Operative Treatment of Varicose Veins.**—Balsamo expatiates on the advantages of a roller bandage commencing at the foot and carried up to the root of the thigh, in operations on varicose veins. The vein can then be extracted rapidly and without hemorrhage.

**Enterostomy in Peritonitis.**—Marchetti reports experiments on dogs with induced peritonitis treated with or without ether lavage plus enterostomy. The peritonitis untreated proved fatal in 100 per cent. in an average of sixty-two hours. The mortality was 83.33 per cent. in the dogs treated with ether lavage after twenty-four hours. The mortality was only 2.5 per cent. when the ether had been supplemented with enterostomy. In the group of six dogs treated in this way but not until after an interval of forty-eight hours, the mortality was 100 per cent. The enterostomy was done on a terminal loop of the small intestine.

Aug. 7, 1922, **38,** No. 32

*Beans and Peas in Culture Mediums. N. Pane.—p. 745.
*Test for Fat in Blood. L. Condorelli.—p. 746.
Suppurating Hydatid Cyst in Liver. O. Cignozzi.—p. 748.
Mechanism of Leukemic State. R. E. Leone.—p. 750.
Operative Treatment of Fracture of Patella. G. Carisi.—p. 755.

**Culture Mediums from Legumes.**—Pane reports attenuation of diphtheria toxin when the bacilli are grown on broths made with beans or peas instead of meat.

**Micromethod for Estimation of Fat in the Blood.**—Condorelli applies Bang's chromic acid technic but has modified the original method, as he describes, for estimating separately the phosphatids and the free cholesterin.

Aug. 14, 1922, **38,** No. 33

*Physiopathology of the Stomach. A. Rossi and P. Marcovich.—p. 769.
*Ultraviolet Rays and Healing of Wounds. R. Rasero.—p. 772.
Gold Salts in Treatment of Tuberculosis. Cicconardi and Reale.—p. 774.
Hernia and Workmen's Compensation. E. Aievoli.—p. 778.

**Physiopathology of the Stomach.**—Continuing his long research in this line, Rossi has been studying the muscular tone of the stomach under the influence of atropin and pilocarpin, and the interrelations between the muscular tone and the other functions of the stomach. The research was done on twelve adults between 25 and 35. Atropin retarded the evacuation of the stomach, while pilocarpin accelerated it in some of the subjects but not in all. The secretory and digesting power seemed to parallel the muscular tonus.

**Influence of Ultraviolet Rays on Healing of Wounds and Ulcers.**—Rasero reports favorable experiences in twenty-two cases of various chronic ulcerations or torpid wounds. He advises to begin with exposures of only three or five minutes, with the lamp 10 cm. from the tissues, progressively increasing the length of the exposures and shortening the distance to bring the lamp in contact with the skin. In one girl, a suppurating skin affection in the neck, which had proved rebellious to all measures, including a course at a seaside health resort, subsided completely after four brief contact exposures.

Aug. 28, 1922, **38,** No. 35

*Double Refracting Power of Muscle. C. Gargano.—p. 817.
*Celluloid Slides in Bacteriology. O. Nuzzi.—p. 818.
*Sedimentation Rate of Erythrocytes. E. Puxeddu.—p. 819.
*Roentgen Ray Treatment of Tuberculosis. A. Pais.—p. 821.
Heredity, Constitution and Tuberculosis. H. Koenigsfeld.—p. 825.

**The Muscle Fibers in Chronic Appendicitis.**—Gargano states that the normal double refraction of polarized light in contractile muscle fibers is a test of its vitality. With chronic inflammation this double refracting property is lost. The appendix, for example, may appear to be sound, but if this property is lost, chronic inflammation can be assumed, and vice versa.

**Celluloid Slides in Bacteriology.**—Nuzzi extols the advantages of using celluloid films, not over 0.11 mm. thick, for slides and object glasses. A noninflammable celluloid can be used.

**Suspension Stability of the Erythrocytes in Malaria.**—Puxeddu relates that the rate of sedimentation of the erythrocytes is much accelerated in plasma from subjects with malaria. There is rapid sedimentation also in malarial blood, but it is slowed when malarial corpuscles are added to normal blood plasma. Addition of bile to any blood seems to retard sedimentation.

**Stimulating Radiotherapy in Tuberculosis.**—Pais is chief of the antimalaria institute in the Rome district, and he has been much impressed with the benefit derived from mild stimulating doses of the roentgen rays applied to malarial subjects presenting symptoms of tuberculosis. The same benefit was observed in cases of uncomplicated tuberculosis, and he insists that this is a powerful ally in stimulating the entire system, the functions of the cells and, above all, of the defensive forces. Manoukhine's method of treating the spleen is an effort in this line, but, he asks, why restrict it to the spleen?

## Rivista di Clinica Pediatrica, Florence

July, 1922, **20,** No. 7

*Clinical Cure of Valvular Disease in Children. C. Cocchi.—p. 385.
*Essential Enuresis in Children. L. Sironi and L. Sabatini.—p. 399.
*Is the Nursing Bottle Indispensable? A. Borrino.—p. 422.

August, 1922, **20,** No. 8

Resistance of Capillaries in Disease. G. Frontali.—p. 449.
Familial Ataxic Syndrome. A. Malaguti.—p. 482.
Diphtheria Antitoxin in Treatment of Noma: Recovery. Ciaccia.—p. 496.

**Cure of Valvular Disease in Children.**—In the case described by Cocchi, symptoms of aortic insufficiency of rheumatic origin in the boy of 5 subsided completely to a clinical cure in a few weeks. The coincident mitral stenosis persisted. The pulse was of the anacrotic type while the diastolic murmur was manifest. He compares this case with the literature on clinical recovery from valvular lesions that had persisted for a longer or shorter period, and he theorizes to explain the anacrotism.

**Essential Enuresis in Children.**—Sironi and Sabatini comment on the contradictory publications as to malformations, occult spina bifida, etc., as factors in enuresis. In their own series of twenty cases of enuresis in children, in sixteen the fifth lumbar vertebra was deformed or there was spina bifida, and in one case the fifth lumbar vertebra and the sacrum had separated. In some there was also myelodyplasia. No deformities of the kind were found in other children free from enuresis. These findings suggest that an anatomic basis for enuresis is not so rare as supposed.

**Is the Nursing Bottle Indispensable?**—Borrino asserts that, even at the best, the nursing bottle is hard to keep immaculately clean, and she has been much impressed with the advantages of feeding even the youngest infants from cup or tablespoon when breast nursing is out of the question or has to be supplemented.

## Archivos Latino-Amer. de Pediatría, Buenos Aires

July, 1922, **16,** No. 7

Chronic Nephritis and Renal Aplasia in Children. V. Hutinel.—p. 321. Cont'd.
*Means to Reduce Infant Mortality. E. Bordot.—p. 353.
Typhoid Parotitis. M. A. Jaureguy.—p. 370.

**Means to Reduce Infant Mortality.**—Bordot reviews the work of the well baby clinic and milk stations at Buenos Aires, 1910-1921. With a population of 1,708,829, the mortality of infants less than a year old has been reduced to 8.1 per cent. The baby clinic reduced the mortality by 16.2 per cent. in 1914 and by 12.5 per cent. in 1921.

## Revista Médica del Uruguay, Montevideo

August, 1922, **25**, No. 8

*Medical and Hospital Records. M. Becerro de Bengoa.—p. 597.
*Library Records. M. Becerro de Bengoa.—p. 601.
*Pregnancy Polyneuritis. C. P. Colistro.—p. 605.
*Diabetes and Pregnancy. F. Cortabarria.—p. 611.
Recovery from Puerperal Septicemia Under Vaccine Therapy. J. Iglesias Castellanos.—p. 616.
A Medicolegal Case. E. Moreau and J. May.—p. 621.

**Hospital and Library Records.**—Becerro de Bengoa describes a simple system of indexing records and books by four letters.

**Pregnancy Polyneuritis.**—In Colistro's case the pregnancy intoxication attacked the peripheral nerves directly, without any phase of uncontrollable vomiting. The woman of 39 was in the sixth month of her fifth pregnancy when the pains and contracture developed in the left leg, with paralysis. The foot was drawn up in talipes equinus and varus, and the knee was flexed by retraction of tendons. After delivery at term the nervous phenomena all slowly subsided, the pains disappearing, and the use of the limb was regained.

**Diabetes and Pregnancy.**—The glycosuria was intense and refractory as also the acetonuria in the multipara, six months pregnant. The glucose in the urine ranged from 49.5 to 16 and 8 gm. per liter, and as the liver seemed to be suffering, the uterus was evacuated. After this the glycosuria and acetonuria subsided, although slight glycosuria persisted for some time. The macerated fetus was unusually large.

## Semana Médica, Buenos Aires

July 13, 1922, **2**, No. 28

*Diversion of the Urine. J. Salleras Pagés.—p. 62.
Subacute Lymphatic Leukemia in Girl. Bazán and Vallino.—p. 92.
*Peripheral Sympathectomy. E. Matons.—p. 98.
Vacuum Extraction of Cataract. M. Leiva Daza.—p. 103.
The Medical Examination. A. Vitón.—p. 103.

**Diversion of the Urine.**—Salleras gives 122 bibliographic references to the various methods of diverting the flow of urine, and presents twenty-seven illustrations. When the diversion has to be above the bladder, nephrostomy is generally preferred to suturing the ureter to the skin. The operations to divert the urine to other organs with an external outlet, bowel, vagina, tubes, etc., are losing ground more and more every day on account of the almost inevitable complications. Diverting the urine into the gallbladder has been done only on dogs. In two of the seven cases reported, nephrostomy on both sides was the only recourse with the inoperable cancer in bladder and prostate.

**Peripheral Sympathectomy.**—By mischance, both of the muscular layers of the artery were cut in removing the sympathetic network around the right external iliac artery. The operation was done to relieve chronic pains and ulceration in the feet. Under mercurial and iodid treatment the lesions had subsided on the left side but had persisted unmodified on the right side until they began to improve after the peripheral sympathectomy. A suppurating hematoma developed in the iliac fossa on that side, and the operation showed that the artery had perforated at the point of the accidental injury, confirmed by the necropsy. The case sustains Leriche's assumption that vasomotor and vasotrophic disturbances may be arrested by interrupting the reflex arc or by removing the nervous network displaying a tendency to neuritis. The case teaches further that the sympathectomy should be done in a region where supervision is easy and can be complete. In this case it might have been done in the middle third of the thigh as well as at the point selected, in the more inaccessible iliac fossa. The media was torn in resecting the adventitia.

## Archiv für Kinderheilkunde, Stuttgart

Aug. 26, 1922, **71**, No. 4

*Congenital Fibrous Cystic Osteitis. E. Wieland.—p. 241.
Parenteral Quinin Treatment in Pneumonia in Children. E. Friedberg. —p. 264.
*Stenosis of Portal Vein in Child. M. Bardach.—p. 270.
*Pituitary Adiposis in Children. G. Peritz.—p. 277.
*Serotherapy in Meningococcus Meningitis. Nebendahl.—p. 294.

**Congenital Fibrous Cystic Osteitis.**—The left leg of the 5 months infant presented congenital diffuse lipomatosis, and the roentgen rays showed symmetrical multiple irregular cavities in the metaphysis in both legs and also in one wrist. The child at 2 looks healthy except for this progressive fibrous cystic osteitis. The right ankle is now bent.

**Stenosis of Portal Vein in Boy of Six.**—The large spleen, severe anemia and profuse hemorrhages in the digestive tract were explained by the necropsy as the result of stenosis of the portal vein. The vein had become embedded in cicatricial tissue from old peritonitic changes, entailing stenosis. The splenic vein showed thrombosis. The bleeding came from varices in the digestive tract. In early infancy there had been a suppurative dermatitis with abscesses. This explained the peritonitic changes. The child had always been pale and had always refused to eat vegetables and fruit. At 2 years there had been a brief period of vomiting of blood, and at 4 years, epistaxis and swelling of joints. Otherwise the child seemed well.

**Pituitary Adiposis in Children.**—Peritz describes the metabolic findings in several cases of "hypophyseal adiposis" in older children, nearly all with inherited syphilis. In two cases in which hydrocephalus seemed to be a factor, the stunted growth was modified by pituitary treatment, one youth of 18 growing 15.5 cm. taller in three years. The growth seemed to stop when the pituitary treatment was suspended. There was no change in the adiposis or dysgenitalism.

**Serotherapy in Meningococcus Meningitis.**—Nebendahl reports that there was only one death in his 8 cases in which the antiserum was given in the first week, while 5 died of the 12 in the second week. The absolute harmlessness of the antiserum was confirmed anew by his 26 cases. The antiserum has to be injected intraspinally and, if necessary, repeated daily, and continued for a few days after improvement sets in. His mortality was 30 per cent., excluding 7 moribund cases. The serotherapy seemed to ward off sequelae. Only 5 of the 14 children that recovered developed hydrocephalus. None of the others have shown the slightest injury later from the disease during the one to three years since to date.

## Deutsche medizinische Wochenschrift, Berlin

Aug. 18, 1922, **48**, No. 33

*The Donné Test for Pyuria. Fürbringer.—p. 1093.
Is There Such a Thing as a General Activation of Protoplasm Accompanied by a General Increase of Performance? W. Seiffert.—p. 1094.
*Experimental Tuberculosis of Lymph Glands. Koch and Baumgarten. —p. 1096.
*Horse and Beef Heart Extracts in Serodiagnosis. H. Felke.—p. 1097.
Nature of Action of Astringents. F. Müller.—p. 1097.
*Carriers of Dysentery Bacilli. P. Bergell and L. Bonnin.—p. 1098.
*Erythrocyte Sedimentation in Gynecology. G. Haselhorst.—p. 1100.
Treatment of Puerperal Fever. L. Reichert.—p. 1102.
The Hereditary Hemorrhagic Diathesis. F. Krömeke.—p. 1102.
Surgical Treatment of Gastric and Duodenal Ulcer. Krause.—p. 1105.
Treatment of Carcinoma of Papilla Vateri. P. Kleinschmidt.—p. 1107.
Primary Myosarcoma of Small Intestine. Glass and Alsberg.—p. 1108.
Affections of the Hip Joint. G. Ledderhose.—p. 1111.

**The Donné Method for the Determination of Pyuria.**—Fürbringer expresses surprise that the Donné test is not more generally used, as he has found it for many years a remarkably simple and rapid method of determining whether there is pus in the urine. [Liquor potassae is added until a white gelatinous deposit is formed.]

**The Experimental Production of Tuberculosis of the Lymph Glands of the Neck by Oral and Conjunctival Infection.**—Koch and Baumgarten state that tuberculosis of the lymph glands of the neck may be caused by an infection of the buccal mucosa or of the ocular conjunctiva. Pulmonary tuberculosis can arise irrespective of the location of the portal of entry of the tubercle bacillus; it may originate through the lymph or the blood stream. The lungs are the area in which tubercle bacilli are most likely to secure a firm foothold.

**Horse and Beef Heart Extracts for Precipitation Reactions.**—Felke has found no essential difference between beef heart and horse heart in performing the Meinicke test.

**Autovaccines for Carriers of Dysentery Bacilli.**—Bergell and Bonnin report five cases in which carriers of dysentery bacilli (Shiga-Kruse) were cured by the use of an autogenous vaccine. Beginning with a weak dose, deep subcutaneous injections in the back were given, the dosage (increased from

day to day) being: 5, 10, 20, 30, 40, 50 and 60 million bacteria. If a reaction occurred, they waited three or four days before giving the next to the last dose. The reactions consist mostly of a slight rise of temperature and often of an extraordinary disturbance of the general health, requiring one or two days' rest in bed, whereupon the symptoms disappear entirely. Two or three strong reactions caused the bacteria to disappear in every case, without exceeding the dose of 60 million. The stools were examined after one, three (or six) and twelve months. Only in one (the most severe) case did a positive finding appear, at the third month, parallel with clinical manifestations, which made revaccination necessary.

**Stability Reaction in Gynecologic Examination.**—Haselhorst has investigated the speed of sedimentation of the erythrocytes in 800 cases in the last two years, and emphasizes the instructive findings in certain conditions. It reveals the presence of inflammation before the temperature or leukocyte count shows any change. He says that we can be almost certain that inflammatory processes have reached the stage when an operation can be attempted when the sediment measures 15 mm. or less in the sedimentation pipet. We can usually feel certain that the field is sterile, so that the danger of the inflammation flaring up anew is reduced to the minimum. In 200 operations there were only three instances in which with negative sedimentation findings he found redness, swelling and recent adhesions, but there was no pus. The technic followed was Westergren's, described in THE JOURNAL, Oct. 22, 1921, p. 1329. He mentions some sources of error to be avoided.

## Klinische Wochenschrift, Berlin

April 22, 1922, **1**, No. 17

What Do We Mean by "Constitution," etc. M. Pfaundler.—p. 817.
Place of Liver in Intermediary Metabolism. F. Laquer.—p. 822.
*Pathogenesis of Certain Types of Icterus. A. Géronne.—p. 828.
*Stain Test of Liver Function. Rosenthal and Falkenhausen.—p. 832.
Liver Affections, January, 1914, to March, 1922. I. Müller.—p. 835.
Damage from Indirect Rays in Roentgen Irradiation. F. Pocs.—p. 836.
*Effect of Atropin on Gastric Motility. C. H. Lasch.—p. 840.
*Pathology of Polycythemia. H. Brieger and J. Forschbach.—p. 845.
*Albumin in Blood Serum in Edema. F. Kisch.—p. 848.
Electrocardiography of Anaphylactic Shock in Guinea-Pig. H. Koenigsfeld and E. Oppenheimer.—p. 849.
Joint Reflexes in Arms. C. Mayer.—p. 849.
*Hemoglobin in Health and in Dis ase. Leschke and Neufeld.—p. 849.
Methods of Testing Liver Functioning. K. Retzlaff.—p. 850.
Import of Pirquet Cuti-Reaction in Children. T. Hoffa.—p. 855.
Formation of Bile Pigments. S. J. Thannhauser.—p. 858.

**The Pathogenesis of Certain Types of Icterus.**—In 1920 and 1921 Géronne examined 46 cases of icterus for leucin and tyrosin. In 2 out of 3 cases of acute atrophy of the liver the findings were positive, but in one of these only just before death. In the third case leucin and tyrosin were never discovered. In 6 cases of severe icterus in the secondary stage of syphilis, a few weeks after arsphenamin treatment, the results were positive in 3. Of 30 cases of so-called "catarrhal" icterus, 8 cases showed a positive result, including one very mild case. He found occasionally leucin without tyrosin or vice versa. Of 7 patients with gallstone colic, with distinct icterus, leucin and tyrosin were found in 2. Géronne holds that in acute atrophy of the liver, damage to the liver cells is the primary cause. Various noxae brought to the liver through the blood stream (either through the portal vein or the hepatic artery) may cause the damage. He assumes the same pathogenesis for a part of the lighter forms of icterus that hitherto have been held and designated as of catarrhal origin. An affection of the bile ducts is not the main factor, as has been frequently supposed.

**Chromodiagnosis of Liver Function.** — Rosenthal and Falkenhausen report that in all forms of icterus examined, in which the flow of bile was not markedly impaired, and in all affections of the liver in which marked parenchyma injuries characterized the clinical picture, the excretion of methylene blue by the diseased liver was considerably accelerated, as compared with the normal. Whereas under normal conditions the excretion of methylene blue through the bile begins in from fifty-five to seventy-five minutes after its injection, and in several cases does not set in for from ninety to ninety-five minutes, in severe affections of the parenchyma of the liver the stain appeared in the duodenal bile in from fifteen to thirty-five minutes after subcutaneous injection of methylene blue. It is therefore evident that diseased liver cells are characterized by an unusually high permeability for methylene blue, as compared with healthy parenchymatous cells.

**Roentgenologic Research on Effect of Atropin on the Motor Function of the Stomach.**—Lasch's investigations showed that excessive peristalsis is usually checked by atropin; hypertonia is reduced, and a relaxation of the stomach walls is brought about. By reason of this tonus-reducing effect, atropin is especially adapted to relieve or dispel pain. The evacuation time is almost always prolonged. Atropin in the cases observed did not prove effective against pylorospasm, although spasm of the antrum pylori subsided under it promptly and repeatedly.

**Pathology of Erythremia.**—Brieger and Forschbach recite a case which they think proves conclusively the causal connection between extirpation or exclusion of the spleen and erythremia. Before the splenectomy, no signs of erythremia had been observed. The clinical picture, they state, presented even to the minutest detail the characteristics of the essential type of erythremia, and proves that elimination of the spleen may cause not only a transitory increase of functioning on the part of erythroblasts but may produce an erythremia of a severe type. This case also helps to substantiate the theory of the excessive stimulation of the bone marrow by elimination of the spleen.

**Albumin Content of Blood Serum in Edema, and Its Absorptive Capacity for Sodium Chlorid.**—Kisch refers to Eppinger's hypothesis according to which the occurrence of renal, cardiac and other forms of edema is traceable to the elimination of albumin from the blood, through injured capillary walls, into the fluid of the subcutaneous tissue: Not the quantity of the filtrate that exudes from the altered capillaries, but rather its albumin content, is the chief factor. Eppinger showed also by experiments on animals with a fistula that sodium chlorid is retained longer in the body or excreted more slowly, corresponding to the quantity of albumin present. Kisch found that in nephrosis (and also in amyloidosis) the albumin content of the blood serum was far below normal, whereas in myxedema it was abnormally high. The sodium chlorid content of the serum varies within wide limits in the various pathologic conditions in which edema formation commonly occurs, and there was no intimate connection between the amount of sodium chlorid in the serum and the intensity of the edema or the amount of albumin excreted in the urine. The capacity of the serum partly to absorb an excess of sodium chlorid was found to be reduced in all pathologic conditions with intensive edema formation; only in nephrosclerosis and in myxedema were the absorptive values approximately normal.

**The Blood Pigment in Healthy Persons and in Those with Blood Disease.**—Leschke and Neufeld determined in the same blood specimen the iron content and the capacity to combine with oxygen. Examination of washed erythrocytes in cases of pernicious anemia, secondary anemia, polycythemia, hemolytic icterus and in healthy subjects yielded no difference in the iron content of the hemoglobin or in the capacity to combine with oxygen. In all cases they found two atoms of oxygen to one atom of iron, which accords with the values to be expected theoretically. They think their experiments prove the uniformity of hemoglobin in the healthy and in the sick. The brown color of the whole blood in pernicious anemia is therefore not due to a degeneration of the hemoglobin but probably, as is the dark yellow color of the serum, to the presence of waste products of the blood pigment.

## Medizinische Klinik, Berlin

Aug. 13, 1922, **18**, No. 33

*Treatment of Ineffectual Labor. E. Sachs.—p. 1045.
Inherited Syphilis plus Tuberculosis in Children. J. Cassel.—p. 1048.
Antivariola Vaccination as Treatment for Whooping Cough. F. Reiche.—p. 1052.
Analogy Between Gastric and Duodenal Ulcer. M. Holzweissig.—p. 1052.
Consequences of Epidemic Encephalitis. Brinkmann.—p. 1054.
The Marasmus Question. W. Spät.—p. 1057.
Irritation from Washing Soaps. C. Siebert.—p. 1059.
*Bilirubin Content of Duodenal Juice. K. Isaac-Krieger and B. Hoefert.—p. 1061.

Version in Obstetrics. W. Strakosch.—p. 1065.
Recent Literature on Heart Disease. E. Edens.—p. 1067.

**Treatment of Ineffectual Labor.**—Sachs says that the pituitary preparations, wisely administered, can be depended on to ward off ineffectual labor. They very rarely fail, and he has never witnessed any harm from them in the over 700 obstetric cases in which he has used them. If the fetus is already suffering, they are contraindicated, but if the heart is beating well, a transient drop to 100 or even below does no appreciable harm. The heart recuperates at once after the extreme labor contraction from the drug. He has given it even with asphyxia when certain that the birth could be terminated immediately afterward.

**The Duodenal Juice.**—The varying flow of bile, the varying dilution of the duodenal content, and other variable elements detract from the significance of the bilirubin of the duodenal juice from the diagnostic standpoint.

Aug. 20, 1922, **18**, No. 34

*Mishaps in Treating Abortion. W. Liepmann.—p. 1077.
*Jaundice Under Arsphenamin. W. Wechselmann and H. Wreschner.—p. 1080.
Estimation of the Constitution. T. Brugsch.—p. 1082.
Progress in Treatment of Fracture of the Radius. Jaroschy.—p. 1083.
*Melanodermia in Pernicious Anemia. M. Mosse.—p. 1085.
Miliary Tuberculosis with Myeloblastosis. E. Wiechmann.—p. 1086.
*Influence of Irradiation on Liver. A. Czepa and F. Hogler.—p. 1087.
*Psychopathology of Asthma. F. Reichmann.—p. 1090.
*Influence of One Infection on Another. S. Suchy.—p. 1092.
Treatment of Disease of Urethra. E. Portner.—p. 1095.
Recent Literature on Pulmonary Tuberculosis. H. Gerhartz.—p. 1097.

**Injuries at Abortions.**—Liepmann quotes Bumm's recent statement that the severer injuries with abortion occur at the hands of physicians. His own experience confirms this. Koblanck even asserts that injury of the bowel in attempting to evacuate the uterus is characteristic of medical intervention. Liepmann gives sketches of some of the specimens from his collection which illustrate these grave mishaps. One shows the curet piercing the posterior wall of the uterus opposite the cervix. In another, the retroflexion had not been recognized, and the curet pierced the anterior wall of the cervix at the curve formed by the bending backward of the uterus. In one case of criminal abortion, the physician found that the instrument the woman had used on herself had perforated the cervix wall and the bladder. The physician on ascertaining this sent the woman to the hospital. A bladder fistula resulted, and she sued the physician for malpractice. Fortunately he was able to produce witnesses to testify that he had refrained absolutely from any intervention. As 90 per cent. or more of all abortions are the result of criminal procedures by the woman herself, the physician must be on his guard against existing perforations. "As A is the first letter in the alphabet so the uterus sound, graduated in centimeters, is the first instrument to use in treatment of an abortion." He explains how to hold it in the right hand with only the thumb pressing it lightly against the hollow of the hand. At the slightest resistance, the sound springs back. "By proceeding in this way, the sound would not perforate even a tissue paper bag, much less the uterus wall. . . . Measurement of the uterus in this way at abortions is as important as pelvis measurements in obstetrics." In a recent case the woman, only one month pregnant, had torn the left wall of the upper cervix and fundus by too abrupt dilation with Hegar dilators. The vaginal portion was intact, and the physician, not aware of the laceration above, introduced a curet which passed through the laceration into the peritoneum when the physician supposed it was in the cavity of the uterus. This case teaches anew the need of extreme caution in artificial dilation of the cervical canal. For this he advises a tent that can be slipped easily into the cervix. It is better to use two narrow ones than a single large one. They must project enough to be readily extracted the next day, but must extend inside beyond the internal os. In one case in which the tent had been inserted too far, he had to slit the cervix to remove it. If it does not reach the internal os, its use is futile. An intramuscular injection of pituitary extract is a useful adjuvant. All these maneuvers can be done in the home; the kitchen table is convenient for it. When the os is dilated enough to admit two fingers easily, the ovum can be removed with the fingers, and the decidua with a large curet. The danger in curetting is naturally less the larger the spoon.

**Arsphenamin with Disease in Biliary Apparatus.**—In two of ten cases of jaundice during arsphenamin treatment, agglutination tests for the typhoid group were positive; in another case there was a history of malaria, and the jaundice subsided at once under quinin. In another case the malaria modified the behavior under arsphenamin although there was no jaundice. The symptoms would have been ascribed to the arsphenamin if the blood had not been examined. In two cases the arsphenamin roused latent malaria to actual chills and fever; in one of the cases it was the first appreciable manifestation of the malaria, acquired in France.

**Melanodermia in Pernicious Anemia.**—The pigmentation in the woman of 54 with pernicious anemia had been progressive for six months. It had nothing to do with the destruction of blood but was actual melanosis, and was probably traceable to the prolonged treatment with Fowler's solution.

**Influence of Radiant Energy on the Liver.**—Czepá states that functional tests of the liver have shown transient derangement after roentgen and radium exposures of the stomach and liver region. The levulose and galactose tests are less convenient and reliable than the hemoclastic crisis after test ingestion of 200 c.c. of milk. The Falta test with bile also proved dependable: The urine is examined by the usual methods every two or three hours during the twelve to twenty-four hours after ingestion of 3 gm. of desiccated bile. Appreciable amounts of urobilinogen testify to pathologic conditions. The details of twelve cases are given. They confirm that changes in liver functioning form an essential element in the general disturbances that sometimes follow treatment with radiant energy.

**Psychopathology of Asthma.**—Reichmann explains bronchial asthma as a curable neurosis.

**Influence of One Infection on Another.**—In the two cases reported, an intercurrent influenza seemed to eradicate the acute gonorrhea in the two men.

## Monatsschrift für Kinderheilkunde, Leipzig

May, 1922, **23**, No. 2

*Infants in Institutions. E. Stransky and O. Gersuny.—p. 145.
Excretion of Creatinin in Infants and Children. S. Ederer.—p. 157.
*Prognosis of Tuberculosis in Infants. R. Osswald.—p. 168.
The Diagnostic Value of Moro's Tuberculin. W. Röckemann.—p. 183.
*Osteomyelitis of the Spine in Infancy. W. Schober.—p. 185.
*Exanthems in Typhoid Fever in Children. J. Kisters.—p. 193.
*Erythrodermia Desquamativa (Leiner). B. Hackel.—p. 197.

**How Do Infants Thrive in Large Institutions?**—Stransky and Gersuny have made investigations to discover how well infants brought up in institutions thrive as compared with those raised in private families. They wished to discover whether the charge of hospitalism is well founded. They found that in the Reichsanstalt for the Welfare of Mothers and Infants at Vienna the children did not suffer more frequently from pneumonia, pyelitis and acute infectious diseases than children raised in families. In the institution at the time were 100 infants and 20 young children. There were 5 cases of smallpox, 11 of chickenpox, 3 of pyelitis and 3 of diphtheria. There were no cases of measles or scarlet fever. With the exception of chickenpox, the infections were confined to one so-called box containing four or five beds. However, it was noticeable that with a protracted stay in the institution the tendency to disease increased. The infants did not gain in weight and length as rapidly as the tables demand, but that may have been mainly due to the scarcity and poor quality of the milk at the time.

**Prognosis in Infantile Tuberculosis.**—Osswald gives short case reports of thirty-six cases of tuberculosis in infants. The prognosis he does not find so unfavorable as is commonly reported—not even in tuberculosis of the lungs and bronchial glands. If children who became infected with tuberculosis as infants once reach the age of 3, they need not be regarded as being necessarily in greater danger. However, the prognosis is not so good for those who contract the infection during the first six months of life.

**Osteomyelitis of the Spine in Infancy.**—Schober reports, because of their rarity, two cases of osteomyelitis of the

spine in infants. Owing to the fact that the localization of the disease process is difficult of access from without, it is scarcely possible to reach a definite diagnosis in time to operate. However, the necropsy findings prove that osteomyelitis may occasionally involve the spine in young children and that, especially in otherwise obscure cases, such an affection should be thought of.

**Exanthems in Typhoid Fever in Children.**—Kisters reports two cases of typhoid in children in which exanthems occurred. In a girl of 12 months there appeared on the buttocks a marked intertriginous eczema. On the abdomen, thorax and upper arms were small reddish spots. Ten days later, there appeared, for the first time, on the left cheek three raised reddish spots the size of pinheads (also two on left side of the forehead), which were in the nature of a roseola. Later, the spots grew larger, no longer disappearing on pressure. Such spots in the face are very rare in typhoid. In the second case, a boy of 9 presented a maculopapulous exanthem. The brownish-red spots were the size of a lentil up to the size of a silver dollar, or a little larger—some isolated, some in groups. Some showed a paler hue in the center. They were mostly on the face and both sides of the nose, but also on the arms and legs—not many on the trunk. On the abdomen, there was a typical roseola, which disappeared on pressure. The evening of the second day, the exanthem on the legs began to blanch and disappeared completely in the next two days. Headache and loss of appetite were associated with the exanthem. The boy recovered, the infant died.

**Erythrodermia Desquamativa.**—Hackel reports an outbreak of erythrodermia desquamativa (Leiner). Of 44 such cases admitted to the Reichsanstalt for Mother and Infant Welfare in Vienna, 1918-1921, 23 resulted fatally; recovery took place in 17 and 4 were dismissed uncured. In the second half of 1920, the clinical picture was especially severe, the disease assuming almost the proportions of an epidemic and most of the cases ending fatally. Almost all the patients were breast-fed children, as is usual. In most cases the children were well developed. In 10 severe cases leukocytosis was noted, the leukocytes in 8 cases reaching from 20,000 to 26,000. An increasing leukocytosis seemed to indicate an unfavorable prognosis. As this blood picture is not found in eczematous, exudative dermatoses, leukocytosis has a certain differential value. The striking similarity of the blood picture with that of septic diseases was noted, but there were no other signs of a secondary septic infection. Two cases ran their course without fever; in the other cases there was slight atypical fever. A combination of breast feeding with one or two feedings of artificial food seems advisable, in general. An albumin milk (prepared according to Moll) was used in several cases with good results (7 recoveries). Neo-arsphenamin was given in 2 cases but without success. Proteotherapy did not avail. In one very severe case the patient recovered under the administration of large doses of lemon juice (6 spoonfuls daily), along with breast feeding. Therefore, in every case of exudative phenomena, the blood picture should receive careful attention.

## Wiener klinische Wochenschrift, Vienna

Aug. 3, 1922, **35**, No. 31

Modern Treatment of Tabes and Paresis. E. Mattauschek.—p. 665.
Hypselophony, a Study of Overtones. A. Gregurina.—p. 669.
Foreign Bodies in the Duodenum. W. Goldschmidt.—p. 671.
Possible Excitive Effect of Arsphenamin on Tabes, Paresis and Syphilis of the Brain in Secondary Syphilis. K. Wagner.—p. 673.
Tuberculosis in Relation to Medical Inspection of Schools. K. Peyrer.—p. 674.

## Zeitschrift für Tuberkulose, Leipzig

August, 1922, **36**, No. 6

*The Fight Against Tuberculosis in Norway. H. Haustein.—p. 403.
*Thoracoplastics. F. Jessen.—p. 425.
*Complications of Pneumothorax. A. Winkler.—p. 476.
Nostrums That Claim to Cure Tuberculosis. K. Klare.—p. 447.

**The Control of Tuberculosis in Norway.**—Haustein spent three months in studying Norway's fight against tuberculosis. In Norway one death in every six or seven is from tuberculosis; in the northern districts, one in every four or five. The law of 1900 enforced compulsory removal to an institution of the tuberculous dangerous to their environment. At the time there were no institutions to receive them, but the law paved the way for the solution of this difficult problem, as institutions were promptly organized for the purpose. Even yet, however, the number is still inadequate. These "homes" are scattered over the country. Each is planned for about twenty inmates; only rarely are there accommodations for thirty or thirty-five. They receive both sexes, and the homelike atmosphere contributes to their comfort. Curable cases are admitted temporarily, as also chronic cases during merely transient phases of aggravation. This shifting of the inmates helps to remove the stigma of the "home" as merely a place to die in. The county physician visits it at least once or twice a week, and each inmate is examined once a month at least. Two nurses care for each home, with several servants, and there are scarcely any restrictions on visitors and visiting hours. These institutions have proved a complete success, he says, and the tuberculous and their families usually seek them voluntarily. Only very rarely is it necessary to invoke the law.

Dr. Heitmann has been in charge of the system, and he is now urging legislation of a still more stringent character: notification by the physician of every case of tuberculosis, regardless of whether it is "open" or not; provisions for free treatment in sanatoriums, etc.; compulsory retention in the institution of "open" cases; authority to separate man and wife against their will; and authority to remove children from a tuberculous environment. The bill authorizes also the destruction of badly infected buildings, provided the owner consents. Teachers must present a medical certificate that they are free from tuberculosis, and if dismissed on account of tuberculosis they are to be pensioned, the state and the community sharing the expense. This bill represents important progress, especially in its doing away with the distinction between open and closed cases. The tuberculous will thus have no reason for trying to deceive the medical examiner. Each physician is constrained to report each case in which he examines or applies treatment, regardless of whether the case has been reported previously. Haustein remarks that this seems rather too sweeping, and yet it is the only means for thorough statistical records. As the notification is by the full name of the patient, duplication can be avoided in the statistics. He adds that one of the strongest elements of the Norway system is that the enforcement of the measures is centralized in the hands of one person, the official chief of the antituberculosis campaign. This official post was created in 1914, and the proposed bill is the crystallization of six years' experience, and all the medical societies and other organizations engaged in preventive work are sustaining it.

**Thoracoplasty.**—Jessen comments on the liability to return of symptoms after pneumothorax treatment of unilateral pulmonary tuberculosis when there is a cavity. Hence he advocates thoracoplasty in such cases without wasting time on pneumothorax, as the results of the thoracoplasty are permanent, and by operating at two sittings, three weeks apart, the intervention is free from danger. At the first the eleventh to the sixth ribs are attacked; at the second, the fifth to the first. The incision parallels the spine, then turns at an angle of 120 degrees, and is carried along above the tenth rib.

**Complications of Artificial Pneumothorax.**—There was perforation of the collapsed lung and this entailed pleuritis on the other side. The lung fistula healed spontaneously as an effusion developed in the space occupied by the pneumothorax.

## Zeitschrift für urologische Chirurgie, Berlin

Aug. 19, 1922, **9**, No. 6

*Surgery of Horse-Shoe Kidney. H. Eggers.—p. 427.
*Muscle Patching After Nephrotomy. A. Ciminata.—p. 433.
Cysts, Polyps and Papillomas of Urethra. S. Gottfried.—p. 451.
*Nonoperative Treatment of Calculi in Ureter. L. Buerger (New York).—p. 456.
Papilloma Implants in Ureter. P. Janssen.—p. 474.

**Surgery of Horse-Shoe Kidney.**—Eggers has compiled eight cases from the literature in which the diseased half of a horse-shoe kidney was removed, and reports a case of nephrotomy on a horse-shoe kidney. This case teaches the necessity for investigating the course of the ureter and

straightening it to ward off compression. It also emphasizes the advantages of supplementary nephropexy. He sutured the left half to the twelfth rib with silk after extraction of the calculi and cutting the isthmus. Pains in the other half of the kidney returned three times during the following month, but subsided on change to the knee-elbow posture. If the attacks return, nephropexy of this half will be indicated. Otherwise the patient is in good health.

**Muscle Patch After Nephrotomy.**—Ciminata's photomicrograms show the findings in twenty dogs in which he had placed a thin strip of free or pedunculated muscle tissue in the slit in the kidney. It healed in place without disturbing the course of the healing of the nephrotomy. The strip is pressed down into the slit and aids in arresting any tendency to hemorrhage. The muscle dies; by the twentieth day there was scarcely a trace left of the muscle fibers, and by the thirtieth, the connective tissue cicatrix was solid.

**Nonoperative Treatment of Ureter Stones.**—This article brings down to date Buerger's work in this line.

## Journal of Biochemistry, Tokyo

January, 1922, **1**, No. 1

Phosphatides of Fish Sperm. M. Sano.—p. 1.
Optical Properties of Sphyngomyelin. M. Sano.—p. 17.
Electromotor Reaction of Frog's Skin. K. Hashida.—p. 21.
Urea Content of Cow's Milk. Simple Method of Determining Urea. Y. Morimoto.—p. 69.
Purin Metabolism. I. M. Kikuchi.—p. 83.
*Studies in Gastric Juice. III. M. Takata.—p. 107.
Nature of Nitrification. K. Miyake and S. Soma.—p. 123.
Mannanase and Laevidulinase. M. Mayeda.—p. 131.
Determination of Assimilation Power for Carbohydrate. K. Sakaguchi et al.—p. 139.
Glycolytic Action of Leukocytes. K. Fukushima.—p. 151.
Influence of Optical Rotation on Cell Permeability. Y. Ketake and M. Okagawa.—p. 159.
Physicochemical Properties of Phospholipin. S. Kakiuchi.—p. 165.

**Nature of Empty Stomach Juice.**—The physical properties of the secretion coming from the empty stomach, for which the term "empty stomach juice" is proposed, and the enzymes present in it were studied by Takata. He found that the empty juice contains pepsin, pepsinogen, rennet, lipase, nuclease, amylase and maltase. A method of determining the amount of mucus in gastric juice is described. The amount of mucus secreted in an unit of time is not at all influenced by feeding. The amount of mucus does not seem to be affected by the presence of 0.5 per cent. hydrochloric acid.

## Tohoku Journal of Experimental Medicine, Sendai

April 31, 1922, **3**, No. 1-2

Studies of Mechanism of Lymph Formation. S. Ocato.—p. 1.
Osmotic Concentration of Blood During Life and After Death. K. Yamakami.—p. 17.
Relation Between Main and Associated Agglutination. K. Aoki and T. Kondo.—p. 56.
Growth of Influenza Bacillus. S. Kondo.—p. 70.
Does Blood Sugar Level Undergo Annual Variation in Dogs? I. Fujii. —p. 74.
*Arrest of Heart Under Digitalis. M. Maeda and F. Nakazawa.—p. 94.
*Origin of Xerophthalmos in Rabbits. Y. Hayashi.—p. 107.
Transport of Sugar Through Thoracic Duct. I. Fujii.—p. 120.
Cold Puncture Hyperglycemia. S. Morita.—p. 136.
Caffein Diuresis. K. Tashiro and H. Abe.—p. 142 and p. 155.

**Arrest of Heart Action in Diastole by Digitalis Group.**—The research was done on the surviving heart of frogs. It confirmed the threefold action of the drug: 1, a paralyzing influence on the conduction system; 2, ditto on the center generating the impulse, and, 3, a stimulating action on the muscular tissue of the ventricle. These three actions do not occur all at once, one or the other predominating according to the dose and the mode of application.

**Origin of Xerophthalmia.**—Hayashi fed healthy rabbits on a soy-bean food that had been cooked at 120 C. for three hours to destroy the vitamin A. After an interval of from ten days to three months the animals began to lose weight and the cornea to become opaque. The changes in the cornea preceded the decline in weight in his animals. The xerophthalmos developed also in a rabbit fed with the same food not cooked long enough to destroy the vitamins. The experimental xerophthalmos closely resembled the similar clinical affection.

## Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

July 8, 1922, **2**, No. 2

*Tuberculous Multiple Cystic Osteitis. N. Voorhoeve.—p. 133.
The Theoretical Bases of Heliotherapy. C. M. Mol.—p. 144.
*Creatin and Creatinin Content of Urine. D. G. Cohen Tervaert.—p. 152.
*Hot Air Treatment in Otorhinology. W. P. Meijjes.—p. 155.
Cerebral Embolism from Heart Disease. K. A. Kroll.—p. 160.

**Multiple Cystic Osteitis.**—Voorhoeve has found records of five other cases like the one he describes. His patient was a girl of 18 who had for eight years an affection of the fingers and toes explained by roentgenoscopy as numerous cysts in the bones without periosteitis. In the later course there were tuberculous changes in skin and lungs, lupus pernio and acrosphyxia.

**Test for Creatin and Creatinin in the Urine.**—Tervaert says that the Blau method is proving reliable for quantitative estimation of the creatin and creatinin even when the urine contains acetone and diacetic acid. The technic and findings are described.

**Hot Air Treatment in Otorhinology.**—Meijjes refers in particular to the benefit from hot air treatment in cases of deafness following acute otitis. The ordinary air douche does not do much good, but when superheated air is used, the ossicles seem to regain their normal play much better. He applies the hot air for fifteen minutes morning and afternoon. He has found this treatment useful also in infectious sore throat, in trigeminal neuralgia, and catarrh of the maxillary sinus. In several cases of acute otitis media, with pain in the mastoid, the mastoiditis retrogressed. This was noted especially in children, as their skulls are thin.

July 15, 1922, **2**, No. 3

*Infectious Diseases in This Century. R. H. Saltet.—p. 226.
Familiol Form of Tuberous Sclerosis. Bastiaanse and Landsteiner.—p. 248.
Fleas in Relation to Plague in Europe. B. Hylkema.—p. 258.
Spontaneous Rupture of the Spleen. J. G. Remynse.—p. 260.
*Etiology of Herpes. K. Edel.—p. 263.

**Infectious Diseases in this Century.**—Saltet compares the mortality from the principal infectious diseases in fourteen countries from 1900 to the war and during and since the war, and discusses the factors influencing the death rate. In conclusion he adds that it might be instructive to study the reasons why Norway has such a very low infant death rate, and why the tuberculosis death rate in Japan is increasing, and why conditions seem to be so unfavorable for small children in Scotland.

**Etiology of Herpes.**—Edel reviews what has been published in recent years on herpes and its virus. Kooij has cultivated a micro-organism from herpes vesicles which induces a special keratitis in the rabbit. It is transmissible, and the same micro-organism could be recovered from the blood and spleen of the rabbits. It reproduces in animals a disease analogous in every respect with lethargic encephalitis. This micro-organism is found in the sputum, and carriers have been encountered. There is thus considerable evidence, he says, that the virus of epidemic encephalitis and of herpes is identical. The coincidence or sequence of herpes and varicella has been reported by innumerable writers. It seems plausible to assume that the virus has an affinity both for the skin and for the nerves. When the dermatropism prevails, varicella develops; when the neurotropism predominates, we get herpes zoster. This dual affinity may be influenced by special conditions in the nerves, or toxic action from an infectious process, or chemical or mechanical influences may decide whether the virus manifests itself in skin or nerves.

July 22, 1922, **2**, No. 4

*Experimental Tar Cancer. H. T. Deelman.—p. 334.
The Respiration Variations in the Plethysmogram. A. A. Weinberg.—p. 343.
Maculipennis Mosquitoes at Amsterdam. N. H. Swellengrebel.—p. 350.
Invagination of Ileum. S. T. Heidema.—p. 360.
Spontaneous Rupture of Uterus. H. P. Kortebos.—p. 363.

**Tar Cancer.**—Among the points emphasized by Deelman from his research on mice is that it takes a certain standard length of time for the benign proliferation of epithelium to occur in consequence of repeated application of tar. It develops cancer in time, but the interval before the cancer becomes manifest varies within a wide range. This sug-

gests, he says, that the precancerous condition develops according to a regular process, but the development of cancer therefrom is dependent on more or less casual circumstances. The cancer seems further to have a multicellular beginning.

July 29, 1922, **2**, No. 5

*Choked Disk. G. C. Bolten.—p. 422.
*The Arneth Blood Count in Liver Disease. G. J. Bon.—p. 432.
Localization of Foreign Body in Eye. A. Verweij.—p. 439.
A New Netherlands-India Mosquito. N. H. Swellengrebel.—p. 443.
Sulphemoglobinemia in an Infant. A. Willemse.—p. 445.

**Choked Disk.**—Bolten reports that a previously healthy man and woman of about 30 developed bilateral choked disk from a small hemorrhage in the brain. In the woman, the loss of consciousness was brief and all the symptoms rapidly retrogressed. In the man, the retrospective diagnosis is that the hemorrhage had been too small to induce compression of the brain, but the clots from it had obstructed the Luschka and Magendie foramens, with consequent hydrocephalus in all four ventricles. Necropsy at about the sixtieth day revealed the blood encircling the medulla oblongata. The inferior posterior cerebellar artery seemed to be the source. In three other cases, very large brain tumors had developed without choked disk at any time or only toward the last. The extremely slow growth explains this absence of choked disk. On the other hand, it may develop early with even a very small tumor if there is much collateral edema. He has seen cases of this kind in which the choked disk had preceded the distinct focal symptoms. It may occur with serous meningitis and acute swelling of the brain, both of which may be regarded as a fleeting angioneurotic edema of the meninges or brain itself. Unless sinus thrombosis is very extensive or bilateral, choked disk rarely is encountered with this alone.

**Arneth Blood Count in Disease of the Liver.**—Bon relates two experiences which show the importance of the Arneth blood count in the differential diagnosis between a gumma and an abscess in the liver. In the first case there was no reduction in eosinophils but lymphocytosis was pronounced, with hyperhypocytosis, excluding assumption of an abscess. In the other case, the blood showed anisohypercytosis with no eosinophils. These findings gave the clue at once, and the symptoms promptly disappeared under arsenical treatment in the first case, and, in the second, under emetin, the hepatitis subsiding without reaching the abscess stage.

## Hospitalstidende, Copenhagen

Aug. 23, 1922, **65**, No. 34

*Spiritualism and Psychoses. A. Wimmer.—p. 545. Conc'n No. 35, p. 561.

**Spiritualism and Psychoses.**—Wimmer analyzes some cases of a psychosis from what he calls medium-itis. In one woman of 42 the manic-depressive psychosis became complicated with the spiritualistic ideas and hallucinations, and these persisted during the intermissions of the other, and seem to be now an independent delirium. In other cases the spiritualistic proceedings elicited a psychogenous mental affection in a predisposed soil. The onset is often acute, but the further course is remittent. A special characteristic of this spiritualistic modern delirium is the blending of self-accusations and religious-mystic hallucinations with erotic and blasphemous ideas. The hallucinations are auditory, rather than visual. The clinical picture is like that of the cases of hysteria delirium in the middle ages, the passional demoniacal "possessions," but the modern type may include automatic writing, rappings, etc., like a medium's trance, when the subjects have attended spiritualistic séances. Wimmer emphasizes that in the mediums' trances and in these spiritualistic psychoses nothing new is ever imagined or produced. The ideas and hallucinations are always drawn from the subject's own store of experience. The present vogue of spiritualistic practices and talk of the "subconscious" is a grave danger for the layman or woman with a nervous temperament inclining to mysticism. It is liable to upset their psychic balance until it gets beyond recovery, as in the three typical cases described. In others, an ordinary mental disease assumed certain features picked up at spiritualistic meetings.

Sept. 6, 1922, **65**, No. 36

*Sugar Content of Blood with Glycosuria. J. E. Holst.—p. 577.
Inclusions in Myeloblasts in Myelosis. A. Nyefeldt.—p. 586.

**Sugar Content of Blood with Glycosuria.**—Holst refers to the great difference in the sugar content of blood drawn from the median vein and from the capillaries after ingestion of carbohydrates. In fourteen cases of diabetes the difference averaged between 0.011 and 0.013 per cent., and in twenty-three cases of glycosuria from other cause it averaged, as in the normal, about 0.023. No regular laws could be detected.

## Hygiea, Stockholm

July 31, 1922, **84**, No. 14

*Tuberculosis of Urinary Apparatus. G. Ekehorn.—p. 561. Begun in No. 13, p. 513.
Postencephalitic Parkinsonism. E. Westerberg.—p. 585.

Aug. 16, 1922, **84**, No. 15

Graphic Records of Lung Findings. C. E. Waller.—p. 609.
Abbreviations in Records of Lung Findings. C. E. Waller.—p. 616.
*Circumscribed Serous Meningitis. E. Sahlgren.—p. 619.

Sept. 15, 1922, **84**, No. 17

Danger of Epidemics in Europe. C. Näslund.—p. 689.

**Diagnosis and Treatment of Tuberculosis of the Urinary Apparatus.**—Ekehorn's article was read as the Lennander lecture. He has found symptoms of cystitis usually the first appreciable manifestation of tuberculosis in a kidney, although the first symptoms may appear in the kidney. Blood in the urine may be the first symptom, without any subjective disturbances. Nephrectomy is the only treatment, and it is not usually necessary to test the functioning of the other kidney beforehand, as the second kidney seldom becomes involved until late. In case of doubt, and if catheterization of the ureters is impracticable, he exposes both kidneys and removes the one most seriously affected—all at the one sitting. He loosens up each kidney but makes no incision nor decapsulation, trusting to inspection and palpation of the kidney and ureter, and suturing without drainage. Removal of the one most seriously involved relieves the other kidney from its toxic action, and the second kidney may recuperate remarkably. If the kidney is totally destroyed, the second kidney has already assumed the functions for both, and the removal of the first kidney is optional.

**Compression of Spinal Cord from Circumscribed Serous Meningitis.**—Sahlgren's patient was a woman of 68 who developed spastic paralysis and paresthesia in the legs after a trauma affecting the spine. The paralysis and contracture promptly subsided after laminectomy, but fatal pneumonia developed. Necropsy the thirteenth day revealed the spinal cord approximately normal. The compression from the circumscribed serous meningitis may have interfered only with the circulation.

## Ugeskrift for Læger, Copenhagen

Aug. 10, 1922, **84**, No. 32

Quinidin in Auricular Fibrillation. S. Andersen.—p. 1003.
*Fatal Neurosyphilis. H. Vøhtz.—p. 1012.

**Acute Neurosyphilis.**—In Vøhtz' two cases there had been no adequate treatment of the syphilitic infection in the young men. Each developed sudden paralysis of the legs, bladder and rectum. In one the whole clinical picture developed in one day; in the other, there had been lancinating pains for four days. The symptoms subsided so promptly in the first case under specific treatment that the spinal cord disturbances must have been merely from compression by a retrogressing gumma. In the other case the ascending myelitis was traced at necropsy to a vascular origin.

Aug. 24, 1922, **84**, No. 34

*Snapping Scapula. P. Jacoby.—p. 1071.
The Diet in Surgical Tuberculosis. R. Hertz.—p. 1088.

**Snapping Scapula.**—The snapping sound as the boy of 10 moves his scapula can be heard across the room. Jacoby describes five further cases in athletes but there was no pain in the region. He analyzes the different factors that may be involved and the treatment that may be called for if the *crepitatio scapularis* interferes with the use of the arm or is painful. Exostoses may have to be cut off, or a plastic operation done, interposing fat or muscle tissue.